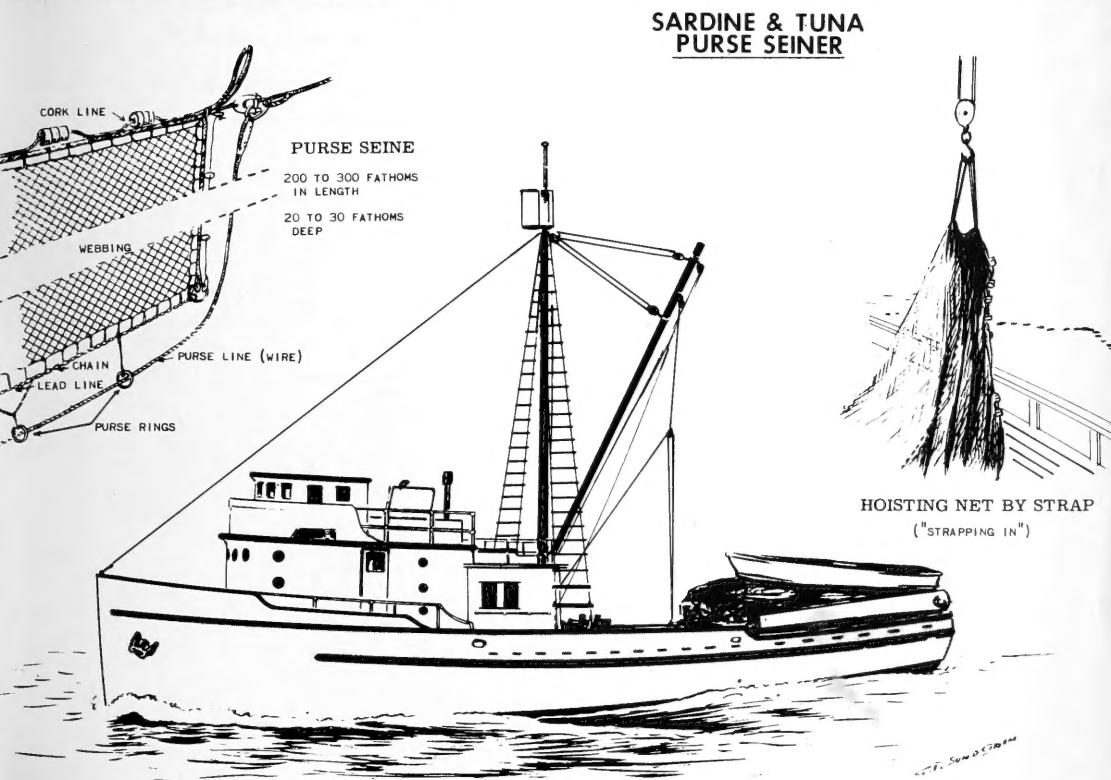


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COMMERCIAL FISHERIES REVIEW



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AN INVESTIGATION OF THE CHEMISTRY OF TEXTURE CHANGES OF FROZEN BLUE CRAB MEAT^{1/}

By George S. Morrison* and Fletcher P. Veitch**

ABSTRACT

A STUDY OF THE CHANGES IN TEXTURE IN FROZEN STORED BLUE CRAB MEAT INDICATED THAT A LOW-GRADE NONENZYMIC RESPIRATION OF THE TISSUE CONTINUES EVEN AT 1.4° F. THE RESPIRATORY QUOTIENT STUDIES INDICATED THAT THE WARBURG RESPIRATION IS DUE TO OXIDATION OF TISSUE CARBOHYDRATES. MORE WORK IS SUGGESTED.

INTRODUCTION

The texture of seafood alters when it is frozen and held in cold storage. With crab meat, there is a progressive increase in toughness. This increase hitherto has been

ascribed to protein denaturation or to desiccation. We decided to study, however, the possibility that the alteration in texture might be caused by certain enzymic changes. In this paper, the question as to whether enzymic changes occur at all in frozen stored crab meat is investigated.

The blue crab, *Callinectes sapidus*, was used as the source of the crab meat. For purposes of orientation it was decided to measure (1) changes in pH, and (2) respiration of the tissues. These measurements were chosen for the information they might yield regarding the type of chemical change occurring. Changes in pH, for example, might be the result of oxidative or nonoxidative decarboxylation or deamination, or simple hydrolytic cleavage of fats and/or proteins, providing that the natural buffering capacity did not hide these chemical changes. Measurement of changes in the respiration of the tissues in connection with any changes in pH would aid in the establishment of the

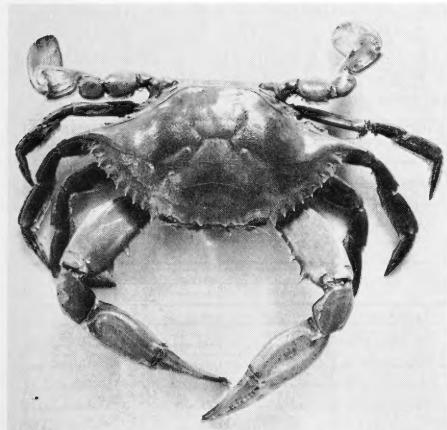


FIG. 1 - BLUE CRAB

oxidative or nonoxidative nature of reactions responsible for pH changes and also aid in determining the presence of decarboxylation or deamination reactions.

It was found that changes in the pH of frozen stored meat were so slight as to be of doubtful significance. Respiration studies revealed the presence of a constant low-grade tissue respiration. We attempted to stimulate the respiration by the addition of

^{1/}THIS STUDY WAS MADE UNDER THE TERMS OF A GRANT FROM THE REFRIGERATION RESEARCH FOUNDATION, COLORADO SPRINGS, COLO.

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possible substrates such as glucose, 1-leucine, oxalacetic acid, sodium pyruvate, dl-malic acid, 1-malic acid, and dL-lactic acid. Adenosine triphosphate (A.T.P.) was added in all respiration studies to obviate the possibility that the concentration of it might become the limiting factor in any enzymic reaction.

Although claw meat, regular grade of white meat, and backfin lump meat (chunks of meat along the backfin) were picked and stored separately, most of the experimental work was done with only the backfin lump meat, since it was more uniform than were the other types of meat and formed better homogenates.

EXPERIMENTAL

THE PREPARATION AND STORAGE OF CRAB MEAT SAMPLES: Three different lots of a dozen each of hard-shell blue crabs were cooked, and the meat was removed and placed in frozen storage. Several other lots also were prepared in about the same manner. In each case, the cooking procedure approximated the method used by commercial packers of crab meat. The live crabs were placed in wire-mesh cages and put in an autoclave. The steam was allowed to pass into the chamber for about 10 minutes during which time air was exhausted from the chamber. The crabs were autoclaved at 15 pounds for about 10 minutes, after which the steam was exhausted for 5 minutes before the door was opened. The crabs were removed, allowed to stand at room temperature until cool, and picked. The meat then was mixed thoroughly to give homogeneous samples. Lots I and II were comprised of 50-gram portions of meat packed in tight packages of moisture-vaporproof cellophane; and lot III was comprised of meat packed in 1-pound friction-top perforated-bottom cans used commercially. These samples were stored at -22° C. (-7.6° F.) for 2 days, after which time they were stored at -17° C. (1.4° F.). Just before being used for testing, each portion with the exception of those from lot III samples was removed to a 2° C. (35.6° F.) storage room for 18 hours and allowed to thaw. Since the portions of lot III were packed in much larger containers, the amount needed for testing was taken directly from one of the containers while in the frozen state. The other lots used were stored in small quantities.

DETERMINATION OF THE pH OF CRAB MEAT: Twenty grams of the meat to be tested were placed in an ice-cold glass cup of a Waring Blender and 80 milliliters of ice-cold water was added gradually. The blender was turned on between additions so

Table 1 - Data on pH and Texture of Backfin Crab Meat after Frozen Storage

Period of Storage at -17° C. (1.4° F.)	pH Cooked Meat			Raw Meat	Texture as Determined Organoleptically
	Lot I	Lot II	Lot III		
Days					
0	7.59	8.00	7.87	6.49 ^{1/}	Normal
10	7.60				Normal
12		7.98			Normal
27	7.62				Normal
40			7.90		2/
56			7.84		2/
61	7.74				Stringy
86		8.08			Stringy
111	7.89				Stringy
160		8.06			Stringy
298			8.04		Stringy
305		7.87			Stringy
345	7.69				Stringy

^{1/}AVERAGE OF 5 DETERMINATIONS USING INDIVIDUAL FRESHLY-KILLED CRABS.

^{2/}SINCE SAMPLE WAS NOT THAWED BEFORE USING, IT WAS NOT POSSIBLE TO ESTIMATE TEXTURE.

that a smooth creamlike mixture was maintained during the process. This mixture, after being thoroughly blended, was transferred to a 250-milliliter beaker and tested, using the large electrodes of a Beckmann Model G pH meter. The sample was stirred occasionally, and readings were taken every 5 minutes until two successive readings

agreed within 0.01 pH unit. The texture of each sample was determined organoleptically at the time of each pH determination. The results of this procedure are summarized in table 1.

DETERMINATION OF ENDOGENOUS RESPIRATION IN CRAB MEAT: A homogenate of 20-percent backfin crab meat by weight was prepared in the same manner as in the determination of pH, except that an isotonic solution approximating the composition of sea water (Lange 1946) was used in place of the distilled water. The buffer solution thus obtained is much more concentrated than is the usual Krebs-Ringer solution, but was used because crab blood approximates the composition of sea water in salt content (Tessier 1938). The composition of this isotonic solution was as follows:

100 parts 0.6 M NaCl	10 parts 0.6 M MgSO ₄
2 parts 0.6 M KCl	30 parts 0.6 M CH ₃ COONa
4 parts 0.4 M CaCl ₂	

After the homogenate had been prepared by the use of this solution, the pH was adjusted to 7.00 by the dropwise addition of 1 molar acetic acid. Three-milliliter aliquots of this homogenate were placed in the main compartments of Warburg flasks, and the oxygen uptake was determined by the usual Warburg technique using KOH in the center wells. The temperature of the water bath was 37° C. (98.6° F.). Respiration values were calculated as microliters of oxygen consumed per hour for 3 milliliters of homogenate. Table 2 contains the results of these determinations.

Table 2 - Values for Endogenous Respiration of Backfin Crab Meat after Frozen Storage

Period of Storage at -17° C. (1.4° F.)	Respiration as Microliters of Oxygen Consumed Per Hour Per 3 ml. of Homogenate Containing 20 Percent (by weight) Backfin Crab Meat		
	Cooked Meat		Raw Meat
	Lot I	Lot II	
Days			
0	2.9		14.9 ^{1/}
10	3.1		
12		4.7	
27	2.7		
40			8.0
56			0.0
61	6.8		
111	3.8		

1/10-PERCENT HOMOGENATE WAS USED HERE, AS THE 20-PERCENT HOMOGENATE WAS A GEL.

DETERMINATION OF THE ENZYMIC ACTIVITY OF UNFROZEN COOKED BACKFIN CRAB MEAT IN THE PRESENCE OF VARIOUS SUBSTRATES: The isotonic buffer solution used in the experiments on endogenous respiration was abandoned in favor of using a phosphate buffer, which was still approximately isotonic with sea water but which did not contain the same proportion of ions. This solution, having a pH of 7.0, was made as follows:

Solution A: 100 parts of 0.770 M NaCl
4 parts of 0.770 M KCl
3 parts of 0.154 M CaCl₂
1 part of 0.770 M KH₂PO₄
1 part of 0.770 M MgSO₄

Solution B: 0.1 M Phosphate buffer, pH 7.4.

Dilute 20 milliliters of solution A to 100 milliliters with solution B and filter if a slight precipitate appears.

This was done in order that the homogenate could be accurately buffered without having to adjust the pH before using, and also to provide phosphates.

To determine the activity in the presence of various substrates, we used two Warburg flasks for each substrate; one contained KOH in the center well and the other did not. In the main compartment were placed 2 milliliters of the substrate in a concentration of 1.5 times the desired working concentration, and 0.25 milliliters of 0.4-percent A.T.P. Three-quarters milliliter of the homogenate was placed in the side arm. Control flasks were prepared by using water in place of the substrate. The flasks and manometers were placed in the bath and allowed to equilibrate for 15 minutes after which time the stopcocks were closed and the initial readings were taken. The homogenate then was tipped in from the side arm, and readings were taken every 30 minutes for 2 hours. The results of this initial trial are summarized in table 3.

Table 3 - The Effect of Added Substrates on the Activity of Homogenates Containing 20-Percent Backfin Crab Meat

Substrate Present	Total Oxygen Uptake Due To Substrate	Total Carbon Dioxide Production Due To Substrate
Micromoles		
0.0833 M glucose	0	0
0.0133 M L-leucine	0	0
0.0833 M dL-malic acid	0	1.93 1/
0.0833 M sodium pyruvate	0	0
0.0833 M oxalacetic acid	0	2/

1/ THIS RESULT WAS NOT VERIFIED IN SUBSEQUENT WORK.

2/ REACTION WAS TOO FAST TO MEASURE. THIS RESULT CAN BE OBTAINED WITHOUT THE PRESENCE OF HOMOGENATE.

Since only dL-malic and oxalacetic acids produced carbon dioxide, the behavior of these acids were investigated further. Oxalacetic acid is known to be unstable, under these conditions, so the experiment with this substrate was repeated without the addition of the homogenate. The reaction proceeded at approximately the same rate as in the presence of the homogenate. In a similar experiment, however, dL-malic acid failed to produce carbon dioxide in the absence of homogenate. It was not possible to obtain the action of dL-malic acid in subsequent trials with the homogenate.

It should be noted here that the production of carbon dioxide shown in table 3 was virtually complete in 10 minutes after tipping in the homogenate. Under these same conditions 0.02 molar dL-lactic acid was also found to produce carbon dioxide. This concentration of dL-lactic acid produced 1.09 micromoles (average of two determinations) of carbon dioxide.

The data in table 3 and from unpublished work with added dL-malic acid and L-malic acid as substrates indicated that L-malic acid stimulated the respiration of cooked and frozen crab meat homogenates more than did the dL-malic acid, indicating a stereospecific enzymatic reaction. Subsequent attempts to duplicate these results were unsuccessful. In fact, further experiments on the respiration of cooked and frozen crab meat at three different temperatures, both in the presence and absence of dL-malic acid, revealed that the addition of the dL-malic acid had no effect on respiration and that the 37° C. (98.6° F.) temperature gradient had only a small enhancing action. The data from these experiments are presented in table 4.

DISCUSSION OF EXPERIMENTAL RESULTS

The data in table 1 show that the pH of the freshly-cooked meat varies widely and that no significance can be attached to the results obtained. This variation is

probably due to the comparatively great buffering capacity of crab meat. Data in tables 2 and 4 indicate that a low level of respiration occurs in the thawed meat even after being kept in frozen storage.

Table 4 - The Effect of Temperature on the Respiration of a 20-Percent Homogenate of Backfin Crab Meat in the Presence and Absence of Added dl-malic Acid					
Treatment of Sample of Crab Meat	Amount of dl-malic Acid Added as Substrate Micromoles	Amount of 20-Percent Homogenate Added Milliliters	Carbon Dioxide Produced at 1/:		
			0° C.	20° C.	37° C.
Cooked and then frozen for 1 week	3	3	0.6 ± 0.1	0.55 ± 0.1	0.75 ± 0.04
Cooked and then frozen for 1 week	0	3	0.77 ± 0.03	0.64 ± 0.04	0.80 ± 0.04

1/AVERAGE OF 3 TO 6 DETERMINATIONS.
 \pm STANDARD ERROR:

$$\sqrt{\frac{\sum d^2}{n}}$$

It was noted in the course of the experiments reported in table 4 that the oxygen consumption by these homogenates was equivalent to the carbon dioxide produced, giving a respiratory quotient of approximately 1.0. This quotient of 1.0 would indicate that the low-grade nonenzymatic respiration exhibited by this tissue is due to the oxidation of carbohydrate.

CONCLUSIONS

1. Changes in the pH of stored frozen crab meat are variable and show no definite trend with length of storage. This variation probably is due to the natural buffering capacity of the crab meat.
2. Cooked and stored frozen crab meat exhibits after thawing a low-grade nonenzymatic respiration even after having been stored at -17° C. (1.4° F.). Further study along this line is suggested as a logical attack on the problem.

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HOW MANY DIFFERENT SPECIES OF FISHES IN THE WORLD?

According to the Curator of Fishes, Smithsonian Institution, there are 40,000 species and subspecies of fish in the entire world. The tropical Indo-Pacific region, which extends from the head of the Red Sea to Easter Island, is considered to be the richest in number of species of fish, containing over 9,000 species.



FISHERY PRODUCTS PRESERVATION BY RADIATION

A study of the irradiation-pasteurization of fishery products is being conducted by the Bureau of Commercial Fisheries Technological Laboratory in Boston. Pasteurization by irradiation achieves partial sterilization of the product treated, with almost all the decay-causing bacteria being destroyed. This new method of preservation may offer a potential means of storing fresh fish for indefinite periods at refrigerator (45° F.) or room temperature storage conditions.

Work to date has included a determination of acceptability of irradiated fish products. Both fresh and blanched fillets of cod, pollock, whiting, and butterfish have been irradiated at the Materials Testing Reactor, Idaho Falls, Idaho. Portions of the fillets were blanched (heated in steam) in order to deactivate enzymes that would deteriorate fish meat during long periods of storage. All samples were irradiated at six different levels (0.125, 0.250, 0.50, 0.75, 1.0 and 2.0 megareps.) with gamma rays.

Taste tests conducted at the East Boston Technological Laboratory have indicated that fish fillets irradiated at certain levels may be acceptable products. Bacteriological studies on these irradiated products, made after two weeks of storage at 35° F., have shown almost no bacteria present. Normally, these fish would be very heavily contaminated with bacteria after this storage period.

Experimental packs of fresh and blanched fish are now being prepared. These packs will be irradiated and stored at ice temperatures over an extended period of time in order to determine the storage characteristics of irradiated fishery products.



FLUOROSCOPIC X-RAYS FOR FISH-BONE DETECTION

Small fish bones, long a problem in the fishing industry, can be detected in fishery products by the use of fluoroscopic X-ray equipment. Research conducted at the U. S. Bureau of Commercial Fisheries East Boston Technological Laboratory, using this method, has shown very good results in the detection of bones.

Several hundred packages of fish sticks (a total of 3,300 frozen fried fish sticks) were obtained for this test from several commercial producers, and were viewed under a fluoroscopic screen. Bones were seen in 128 of the fish sticks. Later, all of the fish sticks were crushed and shredded by hand to feel for bones. By this method, bones were found in 130 of the fish sticks. Use of the fluoroscopic method, thus resulted in an error of only 1.5 percent.

When the crushing method is used, the fish sticks must be thawed and then destroyed. On the other hand, the fluoroscopic method not only is quicker, but it also allows the fish sticks to be returned to the packaging line for further processing after examination.

Further tests using this method will be carried out to determine its applicability for the detection of bones in frozen and fresh fishery products on a continuous-belt production line.



PROVISIONAL DRAFT OF STANDARDS FOR FROZEN FISH BLOCKS PREPARED

A provisional draft of the proposed United States standards for grades of frozen fish blocks is currently being distributed to the fishing industry for comment. The new draft reflects certain industry comments from the first public meetings held to review the preliminary draft for the standards and the results of additional data collected during the interim period. A new format was adopted consistent with the recommendations of the industry. With this new style, the general, and sometimes ambiguous requirements, of the preliminary draft of the standards are eliminated and factor ratings are clearly and specifically defined. The lot certification tolerances have been changed to correspond to the Regulations Governing Inspection and Certification of Processed Fruits and Vegetables and Related Products (USDA, SRA-AMS 155), effective July 1, 1957.



SALT-WATER ICE TESTED ON HADDOCK

One method that has been proposed for protecting the quality of fish stored in ice is to use a salt-water ice. The basis for this assumption is that since salt-water ice melts at a lower temperature than fresh-water ice, the former may offer advantages in increased storage life of fish. An experiment was conducted to compare, under parallel conditions, salt-water ice with fresh-water ice.

Equal quantities of salt-water and fresh-water ice were used to ice representative lots of eviscerated haddock aboard the Service's exploratory fishing vessel Delaware. The cooling rates, storage temperatures, and keeping quality of the fish were determined.

The fish stored in salt-water ice and in fresh-water ice were of excellent to good quality until the 9th day of iced storage, and of acceptable quality from the 9th until the 13th day of iced storage. The fish stored in salt-water ice were cooled faster and to a lower temperature than were the fish stored in fresh-water ice. However, the salt-water ice melted faster than the fresh-water ice and left the fish with less protecting ice. Therefore, the fish in salt-water ice eventually rose to a higher temperature than those stored in fresh-water ice. These results show that in order to maintain fish in salt-water ice at a temperature close to the melting point of this ice, sufficient quantities of ice must be used to compensate for the faster melting.



STUDIES ON THE SODIUM CONTENT OF FISHERY PRODUCTS

The production of dietetic packs of fishery products have led to an increasing interest in the sodium content of fish. The low levels of sodium found in fish have made them a desirable component of diets designed to reduce body moisture levels and to aid in the relief of high blood pressures. The U. S. Bureau of Commercial Fisheries has been engaged in a long-term study to determine the sodium content of the many important species of food fishes and shellfish. Information on the work completed to date will be made available in the near future.

During the analyses of the various species of fish, it became apparent that there is a significant difference in the amount of sodium found in different sections of the edible portion of pink salmon. Samples from the light body meat, from the dark meat along the dorsal surface, from the dark meat along the lateral line, and from the belly flaps were analyzed separately for their sodium content, and the values obtained were compared. The light meat and the dark meat along the lateral lines were found to contain considerably less sodium than did the belly flaps or the dark meat from the dorsal section. In the 15 salmon analyzed, the samples from the pink meat and from the lateral line had a sodium content ranging from 47-79 milligrams per 100 grams of fish, whereas the samples from the belly flaps and the dorsal region ranged in sodium content from 67-198 milligrams per 100 grams.

It is possible that this information will prove to be of value to the canners of dietetic salmon. Canned meats are considered satisfactory for sodium-restricted diets if the sodium content is below 100 milligrams per 100 grams of meat. Dietetic canned salmon generally contains less than 60 milligrams of sodium per 100 grams. By using only the parts of the salmon known to contain a minimum of sodium, the canners may be able to produce a product containing an even lower content of sodium.



EVERYBODY ENJOYS FLOUNDER.

In discussing the merits of their favorite fish food, a westerner may praise his rockfish, an easterner his shad, and a southerner his pompano, but all will agree that flounder is a nationwide favorite.



Flounder is nationally known because it is caught in nearly all of our coastal waters. It is not only sold fresh, but is also filleted, frozen, and shipped to all parts of the country.

It ranges in size from 1 to 15 pounds, is white-meated, and has a sweet-rich flavor. Fishermen recognize the qualities of flounder and know that it does not need to masquerade under a fancy trade name. Although "fillet of sole" appears often on menus, it is not related to the renowned English sole but is usually one of the species of flounder taken in United States waters.

Flounder fillets may be prepared by any of the basic cooking methods of frying, baking, broiling, boiling, or in an endless variety of combination dishes. The home economists of the U. S. Fish and Wildlife Service recommend "Baked Fillets of Flounder" as part of an easy oven dinner.

BAKED FILLETS OF FLOUNDER

2 POUNDS FLOUNDER FILLETS
1 TEASPOON SALT
DASH PEPPER
$\frac{1}{4}$ CUP BUTTER OR OTHER FAT, MELTED

2 TABLESPOONS LEMON JUICE
1 TEASPOON GRATED ONION
DASH PAPRIKA

Thaw frozen fillets. Sprinkle fillets with salt and pepper. Place in a single layer in a well-greased baking pan. Combine butter, lemon juice, onion, and paprika. Pour sauce over fish. Bake in a moderate oven, 350° F., for 20 to 25 minutes or until fish flakes easily when tested with a fork.



TRENDS AND DEVELOPMENTS

Alaska

NEW SHRIMP CANNERY OPENED: A new shrimp canning operation in Wrangell, Alaska, which was started in July 1957 introduces two new developments into the Alaska industry. For the first time, Alaska shrimp are being peeled by machine rather than by hand. The machine used is similar to those used by the shrimp industry on the Gulf of Mexico and in the State of Washington. The cannery is also the first plant in Alaska to produce a canned heat-processed product.

* * * *

STEPS PLANNED TO HALT SALMON SNAGGING: Revision of Alaska fisheries regulations in 1958 to minimize the unsporting practice of salmon snagging--snatching these fish from Alaskan streams on their spawning run with only a series of bare treble hooks on fishing lines--was promised by the Assistant Secretary of the Interior for Fish and Wildlife on August 19. "Present public concern in Alaska about the increased practice of this unsportsmanlike method near major population centers there is certainly justified," said the Assistant Secretary.



Action to remove a prohibition against snagging which previously had been in effect was initiated in 1956. The reason given was that the regulation then in effect had proved difficult to enforce because of the problem of distinguishing between bona fide sport fishing and intentional snagging. In place of it, a regulation limiting the take with hook and line to two fish was provided in some parts of Alaska.

The Acting Administrator for Alaska Commercial Fisheries, whose office is responsible for development of regulations for the taking of salmon, has announced that studies of this problem have been launched with particular attention to a review of the laws of the three Pacific Coast States in this regard. From the studies will come the new measures in the 1958 regulations aimed at a solution of the problem.



American Fisheries Advisory Committee

COMMITTEE MEETS IN ALASKA: Favorable comments on the program of the Bureau of Commercial Fisheries, United States Fish and Wildlife Service, in support of the American commercial fishing industry generally and on the pattern of Saltonstall-Kennedy fisheries projects in particular, were expressed by members of the American Fisheries Advisory Committee following their sixth meeting held in Ketchikan and Juneau on July 22-25.

The Committee also had the opportunity to view first hand the activities of the Bureau in Alaska. The Committee visited the Bureau's Fishery Products Laboratory in Ketchikan to see some of the technological research and fishery management activities there. Members also inspected a cold-storage plant and a salmon cannery. In the Juneau area the Committee observed the spawning runs of salmon in the creeks and rivers.

Some of the more important projects being conducted with funds provided by the Saltonstall-Kennedy Act of 1954 for the betterment of domestic fisheries were explained to the Committee by the use of visual aids. The Committee expressed satisfaction at the progress being made and at the direction being taken by the program.

Members expressed the view that whenever possible the work be conducted by government employees and that only where special conditions exist should contract work be performed. Members also expressed concern over the circumstances which, to an increasing degree, require financing of continuing operations with Saltonstall-Kennedy money. These funds, they believed, should be used for more specialized and critical problems of less permanent duration.

Of the 19 active members of the Committee, 16 attended the meeting. They were: James S. Carlson, Boston, Mass.; Ralph E. Carr, Kansas City, Mo.; Mason Case, San Pedro, Calif.; Chris Dahl, Petersburg, Alaska; David H. Hart, Cape May, N. J.; R. L. Haynie, Jr., Reedville, Va.; Leon S. Kenney, St. Petersburg, Fla.; Donald P. Loker, Terminal Island, Calif.; James McPhillips, Mobile, Ala.; Arthur H. Mendonca, San Francisco, Calif.; J. Richards Nelson, Madison, Conn.; Moses B. Pike, Eastport, Me.; H. F. Sahlman, Fernandina Beach, Fla.; Thomas F. Sandoz, Astoria, Ore.; Arthur Sivertson, Duluth, Minn.; and Lawrence W. Strasburger, Metairie, La.

The next meeting of the Committee will be in the spring of 1958.



California

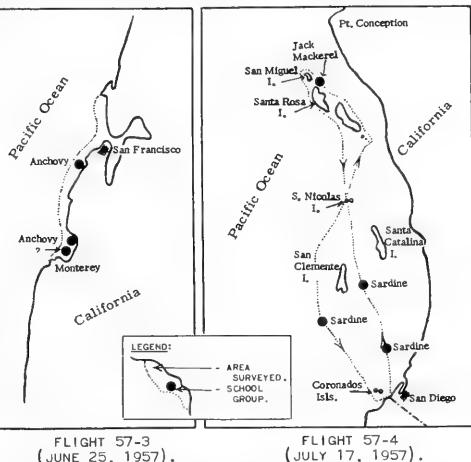
ADULT SARDINE CONCENTRATIONS SURVEYED OFF CALIFORNIA COAST BY AIRPLANE: Two flights were made off central and southern California to determine the pelagic fish distribution and abundance. Particular attention was focused to the location of offshore adult sardine schools. On June 25 the inshore area between Point Reyes and Monterey was surveyed by the California Department of Fish and Game Cessna 3632C (flight 57-3). On July 17 the offshore area between San Miguel Island and Coronados Island, including Tanner and Cortez banks, was surveyed by biologists of the Department aboard the U. S. Coast Guard Albatross (flight 57-4).

Flight 57-3: Scouting weather was ideal during this flight. There appeared to be far fewer anchovies in Central California during this flight than over the past

two years. Three anchovy schools were observed near Santa Cruz and two near Half Moon Bay, but no anchovy schools were seen in the area north of Half Moon Bay.

Five schools of unknown identification were seen in the area four miles offshore of Moss Landing in Monterey Bay. Commercial fishermen scouted in this area on the night after the flight and found a large concentration of adult Pacific herring (*Clupea*). Also, no commercial quantities of anchovies were found in Monterey Bay by the commercial fishermen during the entire month of June and the first three weeks of July.

Flight 57-4: Scouting weather was poor over the entire Southern California area during this flight. Heavy low overcast restricted visibility and the entire flight was conducted at around 700 feet elevation. However, the sea was very calm and the fish schools seen were close to the surface permitting good species identification. Six sardine schools were seen in the area between San Clemente Island and the mainland. One jack mackerel school was sighted at Santa Rosa Island. No fish schools were seen over the Cortez and Tanner banks.



* * * * *

FIRST MATURE SILVER SALMON RETURN TO THE SACRAMENTO RIVER: The forerunners of what California Fish and Game biologists hope will grow into large runs of silver salmon in the Sacramento River were trapped at the Fremont Weir tagging station near Knight's Landing in mid-August. These silver salmon are believed to be the first three-year-old adults of this species to ascend the Sacramento to spawn. Biologists say there is no doubt they are the first mature fish

to return from an experimental plant of 42,000 yearling silvers in Mill Creek in March 1956. Workers at the Fremont Weir hopefully dubbed them "Adam" and "Eve" before tagging them and permitting them to resume their upstream journey, states an August 16, 1957,



Silver Salmon (*Oncorhynchus kisutch*)

press release from California's Department of Fish and Game.

The Sacramento River, an excellent king salmon stream, has never had a silver salmon run. The experimental plant was made in the hope of establishing such a run. Silvers now enter coastal streams both north and south of the Golden Gate, but (except for one recorded stray in 1942) never entered the Sacramento until last fall. At that time, on the basis of counts at Fremont Weir and upstream recoveries, fishery technicians estimated a run of 3,200 precocious salmon, all males, in the Sacramento River. Two small two-year-old females, returning from the March 1956 plant were artificially spawned, one at the Nimbus and the other at the Coleman hatchery.

The arrival of two silver salmon at Fremont Weir is about three months early, according to California Department of Fish and Game calculations. Biologists consider their arrival an indication, however, of a substantial run to come. The female silver salmon weighed 11 pounds when she was checked in, and the male about 9 pounds.



California Cooperative Oceanic Fisheries Investigations

OCEANOGRAPHIC AND BIOLOGICAL OBSERVATIONS: In order to make hydrographic and biological observations off the central and southern California coast, a series of cruises were made by the research vessel Black Douglas of the U. S. Fish and Wildlife Service's South Pacific Fishery Investigations and the research vessels Stranger, Orca, and Horizon of the Scripps Institution of Oceanography. These two agencies are two of three agencies which are operating under the California Cooperative Oceanic Fisheries Investigations. In addition, the vessels made observations of the presence and abundance of marine animals, sauries, and squid at each station.

M/V Black Douglas: This vessel made three cruises: cruise 57-4-B on April 2-26, 1957; cruise 57-5-B on May 8-19, 1957; and cruise 57-6-B on June 4-18, 1957. On the first cruise of the series jig-line catches yielded yellowtail, bonito, dolphin, sierra, and black skipjack. Very few sauries and no squid were observed on the second cruise of the series. On the last cruise of the series, sauries were seen only on two stations and no jig-line catches were made.

M/V Horizon: This vessel made a series of three cruises: cruise 57-4-H on April 10-30, 1957; cruise 57-5-H on May 8-18, 1957; and cruise 57-5-H on June 4-21, 1957.

M/V Orca: This vessel made two cruises: cruise 57-5-O on May 19-23, 1957, and cruise 57-6-O on June 4-19, 1957.

M/V Stranger: A series of three cruises were made by this vessel: cruise 57-4-S on April 10-30, 1957; cruise 57-5-S on May 10-23, 1957; and cruise 57-6-S on June 4-26, 1957.



Cans--Shipments for Fishery Products, January-June 1957



Total shipments of metal cans during January-June 1957 amounted to 62,158 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 52,538 tons in January-June 1956.

NOTE: STATISTICS COVER ALL COMMERCIAL AND CAPTIVE PLANTS KNOWN TO BE PRODUCING METAL CANS. REPORTED IN BASE BOXES OF STEEL CONSUMED IN THE MANUFACTURE OF CANS, THE DATA FOR FISHERY PRODUCTS ARE CONVERTED TO TONS OF STEEL BY USING THE FACTOR: 23.0 BASE BOXES OF STEEL EQUAL ONE SHORT TON OF STEEL.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-JULY 1957: Fresh and Frozen Fishery Products: For the use of the Armed Forces of the Department of Defense, 3.0 million pounds (value \$1.5 million) of fresh and frozen fishery products were purchased in July by the Military Subsistence Market Centers. The July purchases were 46.5 percent greater than in June but 6.9 percent less than in the same month a year ago. The value of the purchases this July was higher by 43.4 percent as compared with the previous month, but lower by 7.7 percent from July a year ago.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, July 1957 with Comparisons

QUANTITY			VALUE		
July		Jan.-July	July		Jan.-July
1957	1956	1957	1957	1956	1957
. (1,000 Lbs.)			(\$1,000)		
2,963	3,184	14,988	15,415	1,490	1,615
				7,635	7,705

For the first seven months of 1957 purchases totaled 15.0 million pounds, valued at \$7.6 million--a decrease of 2.8 percent in quantity and 0.9 percent in value as compared with the same period of 1956.

Prices paid for fresh and frozen fishery products by the Department of Defense in July averaged 50.3 cents a pound, about 1.1 cents less than the 51.4 cents paid in June, and 0.4 cents below the 50.7 cents paid during July a year ago.

Canned Fishery Products: Salmon and sardines were the only canned fishery products purchased for the use of the Armed Forces during July. The Armed Forces installations generally make some local purchases not included in the data given. Actual total purchases are higher than indicated, but it is not possible to obtain local purchases.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, July 1957 with Comparisons

Species	QUANTITY	
	July 1957	Jan.-July 1957
. (1,000 Lbs.)		
Tuna	-	1,450
Salmon	9	1,001
Sardine	20	106

Fishery Management and Wildlife Management Biologist Examination



nature as to show that they are capable of performing the duties required.

For full information on how to apply for this examination, write to the U. S. Civil Service Commission, Washington 25, D. C., or any of its field offices.

The U. S. Civil Service Commission issued Announcement No. 113(B) on July 30 covering positions for Wildlife Management Biologists and Fishery Management Biologists, GS-7 through GS-12. This is a continuously open, unassembled examination. Entrance salaries range from \$4,525 to \$7,570 a year.

All persons who attained eligibility under Announcement No. U-220 for the above-mentioned positions who have not received appointments should apply for the new examination if still interested. Registers to be established under Announcement No. 113(D) will supersede those currently in use under Announcement No. U-220.

The register for Biologist (Federal Aid Supervisor), GS-9 through GS-12, included as an option of the old announcement, will be expired.

Basic requirements for both Fishery Management Biologist and Wildlife Management Biologist are for a successful completion of a full four-year course in an accredited college or university leading to a bachelor's degree. Major studies for Fishery Management Biologist must be in fishery science, biology, or zoology and for Wildlife Management Biologist in wildlife management, biology, zoology, or forestry. The above may be substituted by four years of successful and progressive scientific experience in other responsible fishery or wildlife work of such a nature as to enable successful performance at the professional level, or a combination of technical experience and college courses may be used to meet the basic requirements.

In addition to the basic requirements applicants must show that they have had additional professional experience of from one to three years (depending on the grade) in responsible scientific and technical fisheries or wildlife work of such a

nature as to show that they are capable of performing the duties required.

The United States and Alaska catch of fish and shellfish at mid-year was running considerably below a year ago. Fisheries which yielded slightly over 2 billion pounds of fish and shellfish in the early months of 1957 yielded 2.4 billion pounds during the same period in 1956.

Menahden catches used almost entirely in the manufacture of fish meal and oil, showed the greatest decline. Catches during the first seven months of 1957 totaled 814 million pounds--328 million pounds less than in the same period during 1956.

Tuna and bonito catches on the Pacific Coast declined 31 million pounds; the Alaska salmon catch was off about 27 million pounds; receipts of ocean perch declined 17 million pounds.

Only three items showed marked increases in landings in the first six months of 1957 as compared with the same period last year--the herring catch in Maine (used largely for canning) was up 22 million pounds; herring catches in Alaska (used almost exclusively in the manufacture of meal and oil) were up 16 million pounds; and whiting landings in New England increased nearly 24 million pounds.

In 1956 United States and Alaskan fishermen landed a record catch of 5.2 billion pounds. It is evident that the 1957 catch will fall considerably short of this total.

Marketing Prospects for Edible Fishery Products, July-September 1957

Per capita civilian consumption of fishery products in the United States during the next several months is expected to be close to the year-earlier rate. Judging from the wholesale level in primary markets, retail prices have averaged somewhat higher thus far this year than last and are expected to continue higher this summer.

Commercial landings of edible fish and shellfish through mid-1957 were a little lower than a year earlier. Decreases were indicated for tuna and several other important species of fish and shellfish.

Freezings of edible fishery products in the continental United States through midyear were 2 percent less than a year earlier. May was the only month in which freezings were higher this year than last. July 1 cold-storage holdings of edible fishery products were about as large as on the same date last year. Stocks of these frozen commodities will trend upward during the remainder of 1957 as supplies are built up for distribution during the seasonally low production period next winter.

Through early spring, imports of major fishery products were a little lower than in the same part of 1956. The percentage declines for major canned products and for frozen fillets and blocks were about the same. For fresh and frozen products other than fillets and blocks the total was about as large as a year earlier.

Canned fish exports, the major group of domestic edible fishery products sold abroad, were much lower through early spring this year than last. The reduction in quantity was mainly in canned California sardines, the pack of which was very poor last year.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the U. S. Fish and Wildlife Service, and published in the former agency's July 29, 1957, release of The National Food Situation (NFS-81).



North Atlantic Fisheries Investigations

SCALLOP DREDGE RINGS OF DIFFERENT SIZES TESTED FOR SELECTIVITY (M/V Whaling City): The U. S. Bureau of Commercial Fisheries-chartered vessel Whaling City, during a cruise from August 8-17 on Georges Bank, made 40 tows to test the selective action of 3-, $3\frac{1}{2}$ -, and 4-inch scallop-dredge rings. The cruise was one of a series to develop a ring size in the bag-end of scallop dredges that would retain sea scallops of commercial value and release the smaller scallops of little or no value to the fishermen.

The data gathered on the cruise included measurements of 75,000 sea scallops. Conclusions will be forthcoming after the data are analyzed.



North Atlantic Herring Research

POWER BLOCK DEMONSTRATED TO MAINE SARDINE SEINERS: Demonstrations to Maine sardine fishermen of a powered-block seine hauler were completed during the third week of July 1957 by the Maine Herring Exploration and Gear Research Project of the Bureau of Commercial Fisheries. These demonstrations were made from a Government-owned 35-foot motorboat, the Clupea, to introduce to Maine sardine seiners the labor-saving advantages of this power method of seine hauling.

The "power block" is a large V-shaped sheave, lined with rubber and driven by a hydraulic motor. When in operation, the seine is led through the sheave and to the deck of the boat. Rotation of the sheave then pulls the net up out of the water and drops it on deck. The seine crew needs only to stack the net as it is fed down to them by the block. All the work of hauling the net up out of the water is done by machine power from a main engine or an auxiliary engine.

How the Block Works: Power is transmitted from the engine by means of a hydraulic drive system. A hydraulic pump (which is driven by the engine) pumps hydraulic fluid into lines and the fluid in turn drives a hydraulic motor which is mounted on the "power block." Speed, the amount of pull of the net, and direction

of rotation are all very easily controlled by two valves. The machine can be started, stopped, or reversed by merely adjusting a valve to the proper position. If it should become necessary to remove the net from the block before the end is reached, the block can be opened like a snatch block by pulling a pin, and the net can be pulled out.

Method and Area of Demonstrations: For purposes of demonstration, a 100-fathom by 9-fathom purse seine, minus rings and purse line, was taken aboard the Clupea. This net was run out and hauled back aboard as a demonstration for seine crews and other interested parties. Demonstrations have been made in the more important fishing ports from Portland, Me., as far east as Southwest Harbor on Mt. Desert Island. The 100-fathom seine was hauled and stacked by two men in a demonstration at Tenants Harbor in $8\frac{1}{2}$ minutes. This was done without hurrying, in spite of the fact that the net was stopped several times to clear it of rockweed. A "speed run" was made for a seine crew at Stonington in which two men hauled the 100-fathom net in $5\frac{1}{2}$ minutes.

The block was tried out in an actual stop-seine hauling operation in Burnt Cove, Deer Island, on May 28. For this operation the seine boat was tied alongside the

FIG. 1 - VIEW OF SARDINE STOP SEINE BEING HAULED WITH A POWER BLOCK IN THE MAINE SARDINE FISHERY.

Clupea and the "power block" swung outboard on the boom so that the seine was dropped into the seine boat. (The seine could be dropped into a dory or any other boat in this manner.) The net came aboard smoothly and easily in this operation except when the net snagged on the bottom. It was then necessary to slack off the net and work the snagged net loose by hand. The catching of this snag demonstrated a need for someone to stand close by the control valve and to keep just enough power applied to haul in the net slowly so that the block will stop if the net should become "hung down."

Conclusions: It was evident that each sardine seiner would have to work out his own rigging, in order to adapt a "power block"

to his equipment and his particular operation.

In some operations where only shorter lengths of seine are used and when fishing activities are confined to a local area, changing over to power hauling might not be practical. Where great lengths of seine are set repeatedly and where a large crew is employed for the primary purpose of hauling the net, the savings in man-



FIG. 2 - VIEW OF SARDINE STOP SEINE BEING HAULED WITH A POWER BLOCK IN THE MAINE SARDINE FISHERY.



power that could be effected would be great. The application of "power block" hauling could result in a reduced crew or in the handling of considerably more netting. The natural reluctance to set large amounts of netting where the chance of a good catch is only fair would be diminished since the strenuous physical labor of retrieving hundreds of fathoms of netting by hand would be avoided.

The "power block" also simplifies the process of overhauling nets. A seine can be effortlessly lifted from one boat at a controlled speed and dropped into another boat. It can be just as easily dropped onto a dock at high tide, or into a truck or a storage shed located on or adjacent to a dock.

The "power block" used on the Clupea has a 28" diameter. Others are available with diameters of 12", 18", 25", and 36". An 18" block, costing about \$832 completely equipped with a hydraulic-drive system, is probably large enough for hauling most stop seines.



Shellfish

REVISED GUIDE FOR SANITARY CONTROL OF SHELLFISH INDUSTRY IS-SUED: The Public Health Service issued in August 1957 a revised guide to the Sanitary Control of the Shellfish Industry (1957 edition). The initial publication of standards of recommended practice in this area was developed in 1925 by the Public Health Service at the request of State health departments and the shellfish industry. The current guide is the third revision.

This guide outlines the basic sanitary standards for the cooperative state-industry-Public Health Service program for the certification of interstate shellfish shippers. It includes recommended sanitation practices for harvesting boats and establishments which process oysters, clams, or mussels.

Agencies cooperating in the revision of the guide--Manual of Recommended Practice For Sanitary Control of the Shellfish Industry (Part II: Sanitation of the Harvesting and Processing of Shellfish), PHS Publication No. 33--included shellfish control authorities in all coastal states, food control authorities in inland states, various Federal agencies, the Canadian Department of National Health and Welfare, the Pacific Coast Oyster Growers Association, and the Oyster Growers and Dealers Association of North America.

Some important changes from the previous edition follow:

1. Rowboats, skiffs, etc., used to transport shell stock must have removable false bottoms.
2. Shell stock must be washed reasonably free of mud as soon after harvesting as is feasible. The primary responsibility for washing rests with the harvester.
3. Lighting on working surfaces in packing room shall be 25-foot candles, and on shucking benches 15-foot candles.
4. The number of toilets is specified on the basis of employees both male and female.
5. Returnable containers must be replaced by corrosion-resistant, etc., material by December 1960.
6. Drain valves on blower tanks are easily cleanable.

7. The return of overage (bluff) is eliminated through a provision that no oysters with temperatures above 50° F. should remain on the shucking benches.

8. "Dip" buckets are prohibited.

9. Oysters must be cooled to 50° F. (internal temperature) within 2 hours after packing. If 5-gallon returnables are used, it will be necessary to precool the oysters before they are packed. Crushed ice in the blower tank will accomplish this temperature without difficulty.



South Atlantic Exploratory Fishery Program

EXPLORATORY DEEP-WATER SHRIMP TRAWLING OFF FLORIDA COAST
(M/V Combat Cruise 11): Deep-water shrimp exploration along the east coast of Florida was carried on July 17-30 by the Bureau of Commercial Fisheries-chartered vessel Combat. Thirty-six drags were made in depths of 160 to 565 fathoms, be-

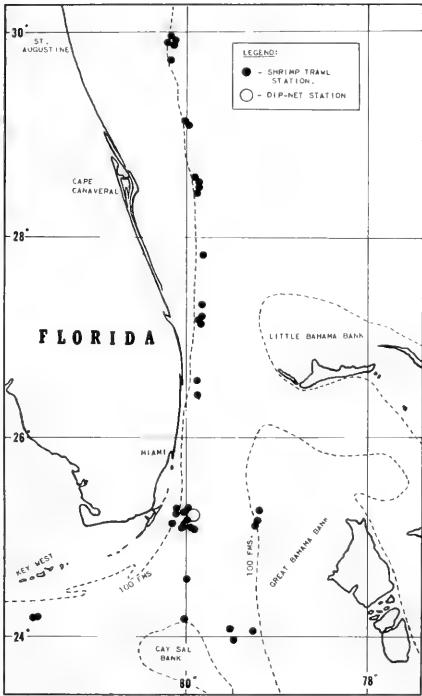


THE SERVICE'S EXPLORATORY VESSEL COMBAT.

tween Key West and St. Augustine, including 8 drags along the western edge of Great Bahama Bank and north of Cay Sal Bank.

Royal-red shrimp were caught in all successful drags in the 160- to 250-fathom zone along the western edge of the Florida Current (Gulf Stream). In the Miami-Key West area, catches were small except for a one-hour 40-foot flat-trawl drag off Carysfort Reef in 185 fathoms which yielded 35 pounds of shrimp.

Catches along the Bahamas did not yield a single royal-red shrimp. Bottom temperatures in this area ranged from 6° to 14° F. warmer than in comparable depths along the western edge of the Florida Current, where royal-red shrimp were caught.



M/V COMBAT CRUISE 11 (JULY 17-30, 1957).

Four drags were made in the vicinity of Carysfort Reef in depths of 40 to 85 fathoms. The only shrimp represented in the catches were a few rock shrimp (Sicyonia).

Twelve 40-foot flat-trawl drags were made in depths of 190 to 240 fathoms between Cape Canaveral and St. Augustine. The best catch (a 2-hour drag off Cape Canaveral) yielded 100 pounds of 21-35 count heads on royal-red shrimp.



Transportation

RAILWAY EXPRESS AGENCY SEEKS ANOTHER RATE INCREASE: The Railway Express Agency has asked the Interstate Commerce Commission for another nationwide increase of 15 percent in carload and less-than-carload rates and charges, including re-icing charges, but not carload refrigeration charges. The Agency explained that this increase would be in addition to the 11-percent increase authorized on May 31, 1957, on Eastern territory movements. (Fish and seafood traffic was excluded from this 11-percent increase.) The I. C. C. is expected to hold hearings on this petition to receive testimony from interested shippers.



United States Fishing Fleet^{1/} Additions

MAY 1957: A total of 74 vessels of 5 net tons and over were issued first documents as fishing craft during May 1957—21 more than in May 1956. The Pacific Coast area

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft, by Areas, May 1957

Area	May		Jan.-May		Total 1956
	1957	1956	1957	1956	
New England . .	4	2	10	8	15
Middle Atlantic.	2	5	14	13	26
Chesapeake . .	8	8	39	29	138
South Atlantic .	8	10	36	24	119
Gulf	12	9	47	38	100
Pacific	27	9	46	23	76
Great Lakes . .	1	-	3	2	6
Alaska	12	10	22	22	40
Hawaii	-	-	-	1	1
Total	74	53	217	160	521

NOTE: VESSELS ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORTS.

^{1/} INCLUDES BOTH COMMERCIAL FISHING AND SPORT FISHING CRAFT.

Table 2 - U. S. Vessels Issued First Documents As Fishing Craft, by Tonnage, May 1957

Net Tons	Number
5 to 9	38
10 to 19	21
20 to 29	4
30 to 39	10
130 to 139	1
Total	74

led with 27, followed by the Gulf and Alaska areas with 12 each, and the Chesapeake and South Atlantic areas with 8 each.



U. S. Fish and Wildlife Service

COMMERCIAL FISHERIES ACTIVITIES, FISCAL YEAR 1956: The Annual Report of the Fish and Wildlife Service for the year ending June 30, 1956, lists activities in fiscal year 1956. The Service's activities of interest to commercial fisheries included: The establishment of the first voluntary standard of grade and condition for fishery products.

Continuation of a vigorous salmon restoration program in Alaska.

Large-scale testing of several electronic devices used in fish guiding, counting, and other fishery research.

Numerous studies relative to shellfish.

Two promising selective poisons for use in sea lamprey control out of 4,600 compounds tested over a period of time.

Numerous oceanic research problems for the benefit of the fishing industry.

Exploratory fishing cruises discovered a yellowfin tuna resource in the southern part of the Gulf of Mexico, located a red shrimp resource in the deep waters of the South Atlantic, found a fishing ground for large lobsters off New England in deep water, found a new ocean perch fishing area, and studied the Maine sardine fishery.

Through a technological research program, the Service isolated certain chemical components of fish oil which may pave the way for the creation of many new products.

Two fishery motion pictures in sound and color were completed during the year and a third started. These films are financed by interested segments of the fishing industry.

Daily Fishery Market News reports were released in key areas from seven strategically-located reporting offices. Fish transportation and importation problems were studied. Monthly bulletins were issued on landings in 12 coastal States and Ohio on Lake Erie.

Vigorous restoration measures were continued in the Alaska salmon fisheries. The pink salmon fishery in Prince William Sound was closed completely and trap fishing in southeastern Alaska reduced by 50 percent; more protection was given salmon in the various bays, and the stream guard program was intensified.

Restrictions were invoked and lake fertilization experiments conducted in red salmon areas.

The Pribilof seal harvest was 65,638 skins; 52,957 skins were sold at auction for \$4,849,610.

Research on the Atlantic salmon, shad, and striped bass continued in eastern waters. In the Northwest considerable laboratory research was done on electrical fish-guiding devices to divert salmon into bypass channels, and on other devices to protect young salmon from squawfish.

Instruments which record the passage of fish through underwater orifices, giving the direction of the movement, were perfected and put into commercial production. Intensive studies of fish behavior during migration were made at the Fisheries-Engineering Research Facility established at Bonneville Dam with the cooperation of the Corps of Engineers. A "sonic tracker," which when attached to a fish sends signals by which the path of the fish can be followed, was developed.

Extensive studies of salmon races were made in accordance with the program outlined by the North Pacific Fisheries Commission.

Studies of the king crab in Bristol Bay, the oyster in Long Island Sound, raft culture for oysters in Massachusetts, soft clams in New England, and the role of chemical elements in the metabolism of marine organism were among the other research projects.

Major attack on the sea lamprey which has ruined fisheries in three of the Great Lakes was centered in Lake Superior where lake trout are still commercially important. All lamprey work was done in accordance with the general program of the International Great Lakes Fisheries Commission.

A new research unit, Ocean Research, located at Stanford University, was opened in September 1955, to study the relationships of climate and ocean conditions to the sudden fluctuations in numbers of commercial fish.

Research continued on sockeye salmon "virus" and on the blue-sac disease.

The Lower Columbia River Fisheries Development Program, in its eighth year, brought more evidence of the soundness of that program. Eleven hatcheries have been completed since the program started and two more--at Eagle Creek, Ore., and Carson, Wash.--were nearing completion when the fiscal year closed.

Seal studies indicated that the fur seal is not a salmon predator. Out of 205 stomachs studied during the project only one of them showed any evidence of salmon. Seal hookworm studies were continued.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JUNE 1957: United States imports of edible fresh, frozen, and processed fish and shellfish in June 1957 were lower by 2.0 percent in quantity and 6.9 percent in value as compared with the previous month.



Compared with June 1956, the imports for this June were down 0.3 percent in quantity and 3.6 percent in value. Imports were lower for some of the higher-priced commodities such as shrimp, spiny lobster, and canned salmon since the value of imports for June 1957 averaged 32.7 cents a pound as compared with 33.8 cents a pound for the same month in 1956.

June 1957 imports declined as compared with the same month last year due mainly to lower imports of frozen ocean perch fillets and canned tuna in brine. These decreases were not offset by the higher imports of fish blocks, haddock fillets, and frozen tuna.

Exports of processed edible fish and shellfish in June 1957 increased 20.3 percent in quantity from the previous month and were also 9.3 percent above June 1956. The June 1957

value of these exports was up by 40.0 percent as compared with the previous month, and higher by 7.7 percent than for June a year ago.

Table 1—United States Foreign Trade in Edible Fishery Products, June 1957 with Comparisons

Item	Quantity				Value			
	June		Year		June		Year	
	1957	1956	1956	1957	1956	1956	(Millions of Lbs.)	(Millions of \$).
Imports:								
Fish & shellfish: Fresh, frozen & processed 1/		58.2	58.4	786.6	19.0	19.7	231.6	
Exports:								
Fish & shellfish: Processed 1/ only (excluding fresh and frozen)		7.1	6.5	82.8	1.4	1.3	19.2	
1/INCLUDES PASTES, SAUCES, CLAM CHOWDER AND JUICE, AND OTHER SPECIALTIES.								

* * * *

RECORD VALUE FOR FISHERY PRODUCTS IMPORTS IN 1956: A new record for the value of imported fishery products was reached in 1956 when products valued at \$281 million at the foreign port of shipment were received in the United States. This was ten percent over the 1955 value, according to a review of the import trade made by the Bureau of Commercial Fisheries. Since 1950 (the first post-World War II year of volume fishery products imports) there has been an increase of 42 percent in the annual value of fishery products imports.

While a new high in the value of imports was attained in 1956, the quantity was only the fifth largest on record--about one billion pounds--this was about the same quantity as received during 1955 and 1953, but considerably less than the record year of 1952 and the runner-up, 1954. Imports of fish meal during 1956, which were about half those of 1952, were principally responsible for the decline in the quantity of import trade. Fish meal imports totaled 408 million pounds during 1952 and 180 million pounds during 1956. Edible fishery products imports remained at a high level in 1956--788 million pounds--second only to 1954.

The United States is the world's leading importer of fishery products. It has been estimated that for every ten pounds of

domestic catch taken and processed, the equivalent of five pounds of foreign-caught fish is used in the domestic market. Imports during 1956 provided about 56 percent of all the groundfish fillets used in the United States, 20 percent of the canned tuna, over one-third of the frozen tuna used in canning, 34 percent of the shrimp consumed, 15 percent of the canned salmon, 46 percent of the Northern lobsters, 70 percent of the canned crabmeat, and 24 percent of the fish meal.

Fishery products represented 2.24 percent of the total value of all United States imports during 1956. Edible fishery products were valued at \$233 million, and inedible products at \$48 million.

The primary source of imported fishery products was Canada which supplied products valued at \$95 million, in large part consisting of groundfish fillets, lobsters, salmon, fresh-water fish, and fish meal. Japan was the second in value with products valued at \$71 million, consisting of frozen and canned tuna, canned crabmeat, canned oysters, frozen and canned salmon, and pearls.

Mexico supplied products valued at \$28 million, consisting largely of fresh and frozen shrimp. Imports from other Latin American countries were valued at \$26 million.

Products imported from Norway were valued at \$13.6 million, and consisted mainly of canned sardines. The Union of South Africa supplied products valued at \$8 million; Peru \$7.3 million; Iceland, \$6.2 million; Portugal, \$4.9 million; and Denmark, \$2.8 million.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA PROVISO: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1957 at the 12½-percent rate of duty is limited to 44,528,533 pounds. Any imports in excess of that quantity will be dutiable at 25 percent ad valorem.

Imports under the quota from January 1-August 3, 1957, amounted to 22,518,460 pounds, according to data compiled by the Bureau of the Customs. This leaves a balance of 22,010,073 pounds of the quota which may be imported during the balance of 1957 at the 12½-percent rate of duty.



Virginia

BIOLOGISTS REPORT PROGRESS IN STUDY OF ARTIFICIALLY-BRED HARD CLAMS: As part of Atlantic Coast State and Federal cooperative studies of the possibilities inherent in the artificial breeding and rearing of clams, the biologists of the Virginia Fisheries Laboratory conclude that hybrid clams can be raised to market size at least a year earlier than wild stock. The hybridizing of clams was developed successfully by the U. S. Fish and Wildlife Laboratory at Milford, Conn., as a step towards developing methods designed to demonstrate to clam producers that clams can be raised in holding tanks until large enough to survive heavy losses from predators. The experiments are described in an August 9, 1957, news release from the Virginia Fisheries Laboratory as follows:

Biologists at the Laboratory rigged in skin-diving gear descended to the sandy bottom of the York River and carefully dug out a group of clams they have been watching carefully for the last three years.

This is probably the most unusual group of clams in Virginia. Each one bears a red number on its shell which enables the scientists to tell where its parents originated, when it was planted, and how much growth it has made. These clams are the offspring of special parents. At the beginning there were four groups of young clams: those of northern males and southern females; those of northern females and southern males; those of southern males and females; and those of northern males and females.

In November 1954, the biologists placed over 400 marked clams in sand-filled boxes and hung them from the end of the Laboratory pier. They were curious to see how fast each would grow and how well they would survive. Checking their planting six months later they found that many offspring of the two southern parentshad died, possibly due to the severe winter weather. The remainder of the brood died in the winter of 1955/56.

In October 1955, the young clams which were still living in trays were divided up. Most of each group was placed on the bottom of the river and the remainder in the trays.

In June 1956 diving operations were begun to recover the planted clams. The clams were meas-

ured and weighed carefully and it was found that the hybrids produced by crossing northern and southern parents were growing faster than those having both parents from northern waters.

The scientists soon discovered that there were other animals than man interested in their young clams. Towards the end of the 1956 summer many of the planted clams had been eaten and only the fragments of their shells remained. It was impossible to determine exactly what had destroyed them but the scientists believe that crabs were the predators.

During their first two winters at Gloucester Point more of the hybrid clams died than those of all northern parentage, but in the spring of 1957 it was discovered that not any of the clams had died during the previous winter. Perhaps this was due to the mildness of the winter. After a check made in July the biologists learned that the clams of mixed parentage were continuing to grow at a faster rate than the offspring of the all northern breed.

At present the clams are in their third year, and the hybrids are approximately 2 inches long as compared with slightly more than 1½ inches for clams of northern parentage. By the fall of 1957 the hybrids should be medium size (cherry-stone) and ready for market.

Farmers have long recognized the value of hybridization for improving quality and yield in their crops. Perhaps the shellfish industry will one day profit from similar techniques.



Wholesale Prices, August 1957

Over-all wholesale prices for fishery products have fluctuated in a narrow range (2-4 percent) since February this year. The August 1957 over-all edible fish and shellfish (fresh, frozen, and canned) wholesale price index (116.4 of the 1947-49 average) decreased 2.8 percent as compared with the previous month, but was up 1.6 percent from August 1956.

From July to August, prices dropped 15.4 percent for fresh large drawn haddock, 14.5 percent for Pacific Coast halibut, 4.8 percent for large and medium king salmon, and 7.1 percent for Great Lakes yellow pike; but whitefish prices went up. The August 1957 index for the drawn, dressed, and whole finfish subgroup declined 7.8 percent from the previous month and was lower by 13.9 percent as compared with the same month a year ago. Lower prices in August 1957 for large haddock, halibut, and salmon did not completely offset the higher prices for the fresh-water varieties.

Fresh processed fish and shellfish prices in August were 5.4 percent lower than in July, due primarily to a seasonal drop in fresh shrimp prices in New York. Supplies of the larger-size shrimp began to increase in August under a new rule. Compared with August 1956, prices in this subgroup this August were up 9.7 percent, due to higher small haddock fillet prices (up 7.0 percent) and fresh shrimp prices (up 21.0 percent). Fresh shucked oyster prices were unchanged from the previous month and the same month a year ago.

Prices for frozen processed fish and shellfish increased 1.8 percent from July to August because of higher frozen haddock fillet prices. From July to August frozen shrimp prices at Chicago declined slightly, and both ocean perch and flounder fillet prices were unchanged. The decline in frozen shrimp prices is not fully indicated in the index since the prices for both white shrimp (which is scarce on the Chicago market) and brown shrimp (slightly lower-priced and more plentiful) are consolidated in computing the index. The August 1957 index for this subgroup was 14.7 percent higher in the same month a year ago, due principally to a 23.7-percent increase in shrimp prices and a 5.4-percent increase in frozen haddock fillet prices.

Canned fishery products prices in August this year, a month ago, and for the same month in 1956 were at about the same level. Maine canned sardine prices declined 5.5 percent between July and August, but other canned fish prices in this subgroup were unchanged. Canned salmon prices in the market was definitely weaker for Maine sardines with some of the canners curtailing operations. The prospects for any substantial increase in the 1957 salmon pack over the light 1956 pack were dim. Tuna producers and canners were still beset by an unsettled market for raw fish. Prospects for a good sardine season (opened September 1 in Southern California) were poor.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1957 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ¹ / (\$)		Indexes (1947-49=100)			
			Aug. 1957	July 1957	Aug. 1957	July 1957	June 1957	Aug. 1956
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					116.4	119.9	117.2	114.6
Fresh & Frozen Fishery Products:					127.0	133.3	128.5	126.5
Drawn, Dressed, or Whole Finfish					112.9	122.5	111.2	131.2
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.08	.09	80.6	95.3	76.5	101.3
Halibut, West, 20/30 lbs., drsd., fresh or froz.	New York	lb.	.32	.37	99.0	114.5	100.6	136.9
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.60	.63	133.7	140.5	139.3	148.3
Whitefish, L, Superior, drawn, fresh	Chicago	lb.	.61	.53	151.2	130.2	154.9	121.5
Whitefish, L, Erie pound or gill net, rnd., fresh .	New York	lb.	.80	.55	161.8	111.2	176.9	131.4
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.61	.61	125.0	125.0	121.9	122.9
Yellow pike, L, Michigan & Huron, rnd., fresh	New York	lb.	.65	.70	152.4	164.1	102.0	129.0
Processed, Fresh (Fish & Shellfish):					134.0	141.7	140.6	122.2
Fillets, haddock, sml., skins on, 20-lb. tins . . .	Boston	lb.	.31	.30	103.8	100.4	102.1	97.0
Shrimp, lge. (26-30 count), headless, fresh . . .	New York	lb.	.85	.95	133.5	150.1	147.8	110.2
Oysters, shucked, standards	Norfolk	gal.	5.75	5.75	142.3	142.3	142.3	142.3
Processed, Frozen (Fish & Shellfish):					131.3	129.0	130.1	114.5
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	102.1	102.1	103.4	103.4
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.29	.27	91.0	83.2	91.0	86.3
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.27	.27	108.8	108.8	112.8	110.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.96	.97	148.9	149.3	145.8	120.4
Canned Fishery Products:					100.2	100.8	101.2	97.7
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . .	Seattle	cs.	22.65	22.65	120.0	120.0	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.),								
48 cans/cs.	Los Angeles	cs.	11.20	11.20	80.8	80.8	80.8	76.4
Sardines, Calif., tom, pack, No. 1 oval (15 oz.),								
48 cans/cs.	Los Angeles	cs.	9.00	9.00	105.0	105.0	105.0	87.5
Sardines, Maine, keyless oil, No. 1/4 drawn								
(3-1/4 oz.), 100 cans cs.	New York	cs.	7.05	7.45	75.0	79.3	81.9	79.8

¹/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.





FOREIGN

International

PERMANENT COMMISSION FOR THE DEFENSE OF MARITIME RESOURCES OF SOUTH PACIFIC

AGENDA FOR FIFTH MEETING: The Chilean Section of the Permanent Commission for the Defense of Maritime Resources of the South Pacific (Chile, Ecuador, and Peru) announced the proposed agenda for the fifth meeting of the Commission which was scheduled to take place in Santiago in September. The agenda was to consist of the following items:

- (1) election of board members;
- (2) report of the Secretary General;
- (3) consideration of applications for permission to hunt sperm whales;
- (4) establishment of quotas for hunting of whales for whale bone from land-based stations;
- (5) establishment of quotas for hunting sperm whales by use of "factory" whaling ships;
- (6) consideration of a "Committee on Biome" concerning scientific bases for sustaining the principle of a 200-mile territorial limit;
- (7) relations of the Commission with the International Whaling Conference;
- (8) statistics concerning fishing and whaling;
- (9) approval of the budget;
- (10) election of the Secretary General; and
- (11) additional business.

In discussing the meaning of the Chilean proposal regarding the "Committee on Biome," the press report referred to the belief that there is need for further study of the inter-relationships existing between climatic elements and atmospheric characteristics of coastal countries with the adjacent maritime zone.



Republic of Argentine

NEW FROZEN SHRIMP PROCESSING PLANT: An Argentine firm recently purchased refrigeration and plant equipment for processing frozen shrimp for export.

The equipment, of Danish origin, and which is said to have cost in the neighborhood of 1,500,000 pesos, is expected to arrive in Argentina in about a month. The plant, of latest design, will have its own power generator and otherwise will be the most modern of its kind in South America. Its location will be at the southern port of Rawson, Provincia of Chabut, where shrimp are found in quantity.

The shrimp season in southern Argentine waters is from October to March and the company expects to get under production during the coming season. It estimates export possibilities are between 660,000-1,000,000 pounds of frozen shrimp during the 6 months season.



Australia

NEW SHRIMP FISHING GROUND FOUND: The shrimp (prawn) survey recently started by the Australian Commonwealth Government has already resulted in the discovery of a large and apparently very rich shrimp fishing ground. An announcement of this discovery was made by the Minister for Primary Industry on July 13, 1957. The new ground is already being fished and shrimp taken there should permit an increase in Australia's shrimp exports, particularly to the United States.

According to an officer of the Fisheries Division of the Department of Primary Industry, 3,000 pounds of king and tiger shrimp were netted on the new ground in one night. Newspaper reports say these shrimp measured 6-11 inches in length. No banana shrimp were found. Banana shrimp are presently the most popular variety exported from Australia.

The ground extends from 6-20 miles off the Southern Queensland coast near Fraser or Great Sandy Island in water up to 35 fathoms deep, states a July 24 dispatch from the United States Embassy in Canberra.

* * * * *

TRAINING CENTER FOR FISHERIES COOPERATIVES AND ADMINISTRATION: The relatively advanced organization of fishermen's cooperatives in Australia and that country's long experience in fisheries administration has led the United Nations' Food and Agricultural Organization to ask Australia to be host to an International Training Center. Participants (about 35) will be nominated by the member Governments (includes the United States) of the Indo-Pacific Fisheries Council. The training center will be held in Sydney and Adelaide from December 16, 1957, to January 25, 1958, it was announced on June 30.

The Center is designed for fisheries cooperative leaders and for Government officials concerned with cooperative organization in fisheries. It will be conducted by the Australian Fisheries Division, Department of Primary Industry, with the Assistant Director of Fisheries as Director. The Food and Agricultural Organization will supply an Associate Director and some lecturers. All other personnel will be supplied by Australia, according to a July 25, 1957, dispatch from the United States Embassy in Canberra.



Brazil

SURVEY BY JAPANESE CONTRIBUTES TO STUDY OF FISHERY RESOURCES: The survey of the fishery resources off the coast of Brazil, under way since the latter part of December 1956 by the Japanese research ship Toko Maru, has resulted in the conclusion that a daily catch of 10-15 metric tons of tuna is possible without depleting the resource. The Japanese research ship was invited to conduct a survey of Brazilian fisheries resources by the Government of Brazil. The Toko Maru is a well-equipped vessel of 1,100 tons with a capacity of 200 tons of frozen fish, a crew of 54, and 8 Japanese scientists.

The explorations of the Toko Maru were first carried out off the southern part of Brazil (Rio Grande do Sul) where 67 oceanographic stations were made. No tuna were found in this area. Later the vessel fished in the waters off the State of Rio de Janeiro for species of tuna. One species of tuna was found off Cabo Frio. From this area, the vessel sailed further north to Maceio and up to the mouth of the Amazon River, where another species of tuna was found.

The survey by the Japanese scientists confirms the results of previous surveys made by two Brazilian specialists in 1938, points out an August 2, 1957, dispatch from the United States Embassy in Rio de Janeiro.



Canada

SALMON SPORT FISHING CATCH IN BRITISH COLUMBIA, 1956: British Columbia sport fishermen last year caught 11 percent more salmon than in 1955, although in the same period the commercial catch of salmon showed a decline.

The sport catch in 1956 of spring and jack salmon totaled 64,000 fish, an increase of nearly 20 percent, while grilse increased from 142,000 fish in 1955 to 168,000 last year. The sport catch of coho declined about 10 percent from the previous year with a total catch of nearly 71,000 fish.

Greater fishing activity from rental establishments and a sharp increase in private boat ownership were the probable reasons for the heavier sport fishing catch.



Cuba

CLOSED SEASONS FOR FISH AND SHELLFISH REVISED: The closed season for lane snapper (biajaiba) and croaker (corvina) originally imposed on April 18; on Cuban snook (bohalo) imposed May 1; and on clams (almejas) imposed on May 10 was officially ended effective July 31.

A closed season was imposed on gray snapper (caballerete) and Cuban snapper (cubera) beginning July 25. The closed season on these species will remain in effect until revoked.

The above changes in regulations were published by the Cuban National Fisheries Institute in the Official Gazette, No. 141, dated July 22, 1957.



Ecuador

FISHERIES TRENDS, 1956: The fishing industry is potentially a strong feature of the Ecuadorian economy. Although Government revenue from licenses granted to United States tuna vessels declined drastically in 1956 (due to the high cost of the license, continued restrictions on privileges of foreign vessels, change in fishing habits of the U. S. tuna fleet, and competition from Japanese tuna), locally-established fishing companies (mostly U. S.-owned) were active, particularly in shrimp fishing.

Ecuador's shrimp exports are valued at about US\$2.5 million annually. This is not apparent from Ecuadorian official figures, which reflect only those dollar earnings which exporters are required to deliver to the Central Bank. The delivery requirement was increased from \$100 to \$300 a ton in 1956 on the ground that the Government was being deprived of too great a share of the fisheries revenue. The Government also insisted that companies pay full export taxes on frozen fish shipments, since little actual canning was being done.

A pilot fish flour plant was opened at Manta under Food and Agriculture Organization auspices, points out a July 16, 1957 United States Embassy dispatch from Quito.



France

IMPORTS OF CANNED FISH, 1956: In 1956 France imported approximately 62.3 million pounds of canned fish. Of this 2 million pounds, valued at about 339 million francs (US\$968,571), consisted of salmon; 40.8 million pounds, valued at about 6.2 billion francs (\$17.7 million), consisted of sardines; 19.4 million pounds, valued at 2.2 billion francs (\$6.3 million), consisted of other fish.

French Morocco was the principal supplier of canned sardines with 30.1 million pounds. The next largest supplier was Portugal with 5.5 million pounds.

Some of the countries that provided France with various kinds of canned fish other than sardines were as follows: Tunisia, 4.4 million pounds; Western Germany 4.4 million pounds; French Morocco, 2.6 million pounds; Norway 1.9 million pounds; and Portugal, 1.7 million pounds. (Industria Conservera, March 1957.)



German Federal Republic

FACTORYSHIP HAS UNUSUAL NEW DESIGN: An unusual new design is the principal characteristic of the German Diesel-driven factoryship Heinrich Meins, built in Bremerhaven. The vessel, which was on its maiden voyage to the cod fishing grounds off Greenland in June, has a stern like that of the British factoryship Fairtry and no rudder, points out the June 14 issue of The Fishing News, a British fishery periodical.

Her endurance is 60 days. Her two most unusual features are a slip-way stern (as in the Fairtry) and two propellers set forward of the engines. Steering is controlled by these propellers so that the craft has no rudder.

The owners were pioneers in this type of vessel and have already ordered a sister ship which, however, will be driven by ordinary screws.

The vessel Heinrich Meins cost 3.5 million Deutschmarks (US\$833,000).

The most impressive part of the ship is undoubtedly the working space below decks. The catch is handled on a "production line" system, with moving belts and no more than 5 or 6 men are necessary to work the catch (fish can be handled faster than they are caught).

The fillets proceed in a bulk wagon (on rails) to an American-type freezing room, where they are frozen for two hours at -48° F. The freezer can handle 8 metric tons a day. Fillets, particularly of cod, can be salted instead of frozen.

The maximum (for about 30 fishing days) is a catch of about 50,000 pounds a day, and the catch for the last 3 or 4 days of the trip will be iced for sale as fresh fish.

The fish are handled on the lower deck, from which three large openings lead to the fresh-fish hold. Moving bands go

down into the fish-meal factory, which has a daily capacity of 20 tons, and also to the cooking boilers. The vessel holds 80 tons of meal and 47 tons of fish oil.

The captain's cabin is on the starboard side below the main deck, and the chief engineer's cabin is over the engine-room. The crew's cabins hold from 2 to 6 men each, and the wireless room is under the bridge.

The vessel's main specifications are as follows: gross tonnage, 825.74; net, 347.08; over-all length 228 ft.; length at waterline 213 ft.; beam 33 ft.; fresh fish capacity, 5,500 baskets; deep-freeze capacity, 148 cubic meters net; fish meal capacity, 135 cubic meters. She will be capable of 13 knots with 1,200 hp.

From the stern, going forward, there is the slipway and netroom, the fish-meal plant, fish-meal storage, oil plant, oil tanks, and fish room.

On the second deck--fish factory, engineroom with two Diesel engines driving two propellers, and sundry tanks in the bows. Accommodation is forward, as is the bridge and winch gear.

The ship is built of steel. She has two decks, the lower being the freeboard deck. The usual fishing gear is built in. Provision is made for a crew of 38 men. With a view to long-range operation, reserve cabins are provided in addition. The main bridge has an unhindered view aft, and the chartroom, though small, is sufficient for its purpose. The winch gear only differs from the usual equipment in having two extra small drums, and has electric drive.

The two propellers are set forward of the engine so that the nets, which go over the stern, should not foul the screws. One of the particular features of the propellers used is that no rudder is necessary.

The main engines are two Diesels giving a maximum of 750 hp., each with reduction gear to the shaft. There is also a Diesel dynamo compressor, and a Diesel dynamo of 80 kw.

An oil-fired auxiliary boiler and two gas boilers are provided, and also a fresh-water plant.
NOTE: THE FAIRPORT HAS SCREWS AT THE REAR, BUT HER OVERHANGING SLIPWAY PROJECTS SUFFICIENTLY FAR BEYOND THEM TO AVOID ANY RISK OF FOULING.

* * * * *

PRACTICAL TESTS OF ELECTRICAL FISHING PROPOSED IN COASTAL WATERS: From Kiel, Germany, comes the report that the first practical tests will be made in coastal fishing with electrical fishing devices. These trials will not be new isolated tests but will be done on a large scale.

In the method that will be used, the fish will be lured into nets by creating an electrical field. This invention is chiefly credited to Dr. Kreuzer and Peglov, an engineer. Many trials have been made with electrical fishing lines in fishing for tuna. (Spanish fishery periodical Industria Conservera, March 1957.)



Guatemala

FISHING RIGHTS GRANTED IN MAY 1956 SHOW PROMISE OF DEVELOPING INTO LARGE INDUSTRY: As a result of the agreement signed on May 2, 1956, by the Guatemalan Government, it now appears that fishing operations will start soon on the Pacific coast of Guatemala, provided some controversial points can be settled. Territorial fishing rights (not exclusive) are granted for 10 years and are for fishing off both the Pacific and Atlantic coasts, states a June 10 dispatch from the United States Embassy in Guatemala. The territorial fishing rights were granted to a local businessman.

The dispatch states that investments in boats, equipment, and materials for the planned Pacific operation may reach US\$4 million. Under the terms of the contract, the contractor is authorized to subcontract any part of the operation which he elects. Reports from other sources indicate that the boats to be used will be provided by two United States fishery concerns. These firms will probably make unspecified additional investments in one form or another. Emphasis will first be placed on shrimp fishing with plans to extend to fish later. Also, plans are already under way to extend operations to the Atlantic side.

The mothership Iirma Catalina is already at San Jose ready to begin operations. It is a large modern boat, valued at US\$2 million. Three smaller boats also have arrived at San Jose and others are believed to be en route. Under the terms of the Guatemalan Industrial Development Law, machinery, equipment, and supplies would be permitted entry duty free.

In addition to developments under this contract, the government has recently announced the signing of a similar contract with another local business firm. Several additional United States firms are expected to make investments, in one form or another, in any operations which may develop under this contract. It has been reported that the initial capital investment is US\$100,000; the extent to which this will increase depends upon future developments.

This second contractor plans to first conduct additional exploratory work. If the results look promising, present plans would be to first concentrate on shrimp fishing on the Pacific coast and later extend operations to fish and to the Atlantic side. Considerations are being given to operating at Ocos, near the Mexican border, provided the cost of making this port suitable for fishery operations would not be prohibitive.



Italy

FROZEN TUNA DELIVERED BY JAPANESE VESSEL: A Japanese tuna vessel delivered frozen tuna to the Italian port of Venice in mid-1957. The fish was caught by the Japanese vessel in the Indian Ocean.

A number of contracts have been signed and others are in the negotiation stage for deliveries of full loads of frozen tuna in October and November 1957 at Genoa, Leghorn, Naples, and Bari.

Two Japanese fishing vessels will make the deliveries. One is operated by a Tokyo fishing firm and the other by an Osaka fishing firm. (Il Giornale Della Pesca, July 20, 1957.)



Japan

NORTH PACIFIC SALMON CATCH FOR 1957 BY MOTHERSHIP: Japan's North Pacific salmon catch from mothership-type operations for the 1957 season totaled 99,984 metric tons, roughly equal to the 100,000-metric-ton quota established for this year under the U.S.S.R.-Japan Fisheries Agreement. Final figures of the salmon catch from shore-based drift-net fishing operations in the restricted area are not available, but the above source estimates that the 20,000-metric-ton quota was met without difficulty.

According to the Japanese Fisheries Agency, Japan's salmon catch for the 1957 season (May-August 10) from mothership-type operations in the North Pacific was larger than for the previous year when 93,000 metric tons were caught. A breakdown of the quota and the actual salmon catch for 1957 by areas is reported as shown in table.

No final figures of the above catch by species are available at this time, however, industry sources report that the catch of commercially-valuable red salmon

	Quota .. (Metric Tons)..	Actual Catch
Aleutian Waters	87,000	86,984
Okhotsk Sea	13,000	13,000
Total	100,000	99,984

counted for 20 percent of the total salmon catch.

was exceptionally good. It has been estimated by them that the red salmon catch for the 1957 season will make up about 45 percent of the total salmon catch. During the 1956 season, the red salmon catch ac-

The Japanese fishing industry attributes the highly successful catch to favorable weather conditions, abundant salmon runs, and the absence of Russian interference in the fishing area. The Japanese Fisheries Agency reports that the salmon catch per haul was so heavy in some cases that fishermen experienced difficulty in hauling in their nets. Furthermore, they report that the whole salmon fleet was able to meet its quota for the season between July 15 and 31, far ahead of the deadline date of August 10.

In addition to the mothership-type operations, there are Japanese shore-drift-net boat operations in the Aleutians. Although no information regarding their salmon catch is available at this time, a Japanese Fisheries Agency official reported that it is expected that the 20,000-metric-ton quota for the 1957 season was met without difficulty. Final salmon catch data are expected to become available about the end of September (U. S. Embassy in Tokyo, dispatch dated August 16, 1957).



Libya

FISHING AND SPONGE INDUSTRY: The Mediterranean Sea off the coast of Libya is amply endowed with sponge beds and fishing grounds containing tuna, sardines, red mullet, marjan, trillyh, garagone, and other varieties. Many of the fish caught are unusually large and well developed. One scientific hypothesis attributes this to the beneficial effects of the frequent ghibli winds from the interior which carry out to sea large quantities of sand with a fairly high salt content. Local fishing boat captains, however, explain the rich and varied fish life as due to plentiful marine vegetation in fairly shallow waters, pointing out that there is an exceptionally wide continental shelf, from 17 to 45 miles wide, all along the coast of Libya.

Fishing: Despite this long coastline and rich potentialities, however, fishing is of minor importance. The Libyan Arabs are not a seafaring people and most of the fishing is done by Italian, Greek, and Maltese ships or crews. The main commercial catches are sponges, tuna, and sardines.

The canning of tuna and sardine is concentrated in Tripoli where seven firms are engaged in the industry. There are about 240 small boats engaged in this fishing, most of which is limited to Tripolitanian waters.

Sponge Industry: The sponge fishing industry can be traced back over 2,000 years and by tradition it is monopolized by Greek fishermen. Only a very small fraction of the sponges, some 3 to 5 percent, is obtained by the Arabs using small boats and harpoons, or skin diving, in the shallow inshore waters up to depths of 10-15 fathoms. Deep-sea trawlers account for about 20-30 percent of the harvest. The best results in both quantity and quality are obtained by the third method, the use of diving ships. These vessels, almost exclusively Greek-owned or operated, exploit the sponge beds at depths of 10 to 35 fathoms or more. Casualties among the divers are high; many deaths result from Caisson's disease, but this is apparently accepted as a necessary evil.

The number of ships and small boats used in sponge fishing varies from season to season but the average year will find about 120 diving ships operating in deep water, while the number of small boats is roughly estimated at around 120.

Exports:

Libya's Exports of Marine Products, 1954-56						
	Quantity			Value		
	1956	1955	1954	1956	1955	1954
	(Metric Tons) (US\$1,000)					
Sponges.	50	70	109	531	713	1,054
Preserved Fish	913	719	775	464	312	310
Fresh Fish . . .	140	139	-	44	55	-
Total	1,103	928	884	1,039	1,080	1,364



New Caledonia

MARINE PRODUCTS INDUSTRY: Although the waters surrounding New Caledonia contain an abundant supply of fish of all types, the inadequacy of the supply for local consumption necessitated the importation during 1956 of 277 metric tons of canned fish valued at 10,000,000 francs (US\$157,000). Local production rarely exceeds 20 tons a month. Japanese fishing boats have recently been sighted in the nearby waters in search of tuna, but nothing is known here of their success.

About 2,000 people are engaged in the trochus shell industry. The industry suffered considerably in 1956 as a result of the depletion of shell stocks. Despite increases in the export price from 50,000 to 60,000 francs (US\$785 to \$942) per ton, production in 1956 fell to 402 tons from 723 tons in 1955. The total value of the trochus shells exported during 1956 was estimated at 25,000,000 francs (US\$392,000). The industry has made efforts to replenish the island's stocks of shells, but it is doubtful whether the results will be significant for several years. (United States consular dispatch from Noumea, July 8.)



New Hebrides

TUNA FISHERY AND CANNERY PLANNED: Santo, New Hebrides, is to have a tuna fishery enterprise and cannery. Little has been heard of this project for almost a year and at that time it was believed that nothing would come of the scheme, due to anti-Japanese feeling in the New Hebrides and in Australia.

Originally the scheme was to catch and can tuna in Santo with the aid of Japanese fishermen and technicians. The original scheme may have been modified since then, as it is now stated that the cannery side of the project involves a French canning company and a Japanese fishing company.

Work is now in progress on a wharf at Palikula (SE. Santo) and also a refrigeration plant that will be able to turn out

20 tons of ice a day. There will be a freezing chamber and cold-storage as well as an ice-making plant. A mechanical conveyor will transport the fish from the fishing vessels to the plant.

The bulk of the fish taken and treated for export will be tuna, with some bonito, states the Pacific Islands Monthly of May 1957. The fish will be caught by Japanese-owned and manned ships which will operate on 12-month contracts before returning to Japan for overhaul, etc. There are at present 15 Japanese technicians at Palikula supervising the erection of the freezing plant; 34 more are expected to be given 3-year entry permits pending the time when local people, native or Tonkinese, are trained to operate the plant.



Norway

FISH CANNING INDUSTRY, 1956: The principal products of the Norwegian fish canning industry are brisling, sild, and kippered herring. The pack of kippered herring in 1956 amounted to 75 percent of a normal year's production, due to a large quantity of stocks held over from the previous year.

The brisling sardine pack has been down for some time. Only 197,768 cases were produced in 1956--approximately two-fifths of a normal year's pack (about 500,000 cases).

The catch of small sild herring, adequate for canning, declined in 1956. The repercussion of this was felt in the raw material available to canneries. The usual total yearly pack of small sild has been approximately 900,000 cases, but in 1956 the pack amounted to only 634,893 cases of smoked sild and 51,459 cases of unsmoked sild.

Exports were affected by the low brisling production. From January 1 to December 1, 1956, total exports of canned fish amounted to 28,000 metric tons, valued at 127.3 million crowns (US\$17.8 million). For the same period in 1955, exports of canned fish amounted to 28,611 tons valued at 130 million crowns (US\$18.2 million). (Industrial Conservera, March 1957.)

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WHALE OIL AND MEAT SUCCESSFULLY PRESERVED WITH ANTIBIOTICS: A Norwegian whaling company reports that its extensive experiments with injecting antibiotics into whales, at the same time as they are harpooned or shortly after, have been most successful. The whale meat has kept fresh much longer than usual, and the yield of best-grade oil has been boosted from 70-90 percent of the total production. Last season, at South Georgia, some 500 fin whales were injected with terramycin, made by a United States firm. The tests are conducted in close cooperation with the United States firm.

The whaling company's chief chemist says the whale oil shows no trace of antibiotics. Also, the meal and other byproducts of terramycin-treated whales are of higher quality than those made from non-injected animals. New experiments, now under way in North Norway, will aim at better meat preservation. (News of Norway, August 15, 1957.)

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WHALING INDUSTRY TRENDS: **Whale Oil Prices:** Sales of Norway's 1956/57 Antarctic whale oil production at the beginning of the April-June 1957 quarter were made at about US\$252 a long ton (2,240 pounds) as compared with an average of about \$240 a ton for the 1955/56 season. By May prices had dropped to \$238 a ton and 47,000 tons were reported to have been sold at this price. According to late June press reports, 31,000 tons remained to be sold out of a total of 140,000 tons, a July 25 dispatch from the United States Embassy in Oslo states.

Limitation on Number of Catcher Boats: During an early June conference in London, preceding the meeting of the International Whaling Commission, Norwegian whaling companies were unsuccessful in persuading the Dutch and Japanese to limit the number of catcher boats. Norwegian whaling companies are interested in having the number of catcher boats reduced because they consider it uneconomical to support more than a limited number.



Panama

SHRIMP INDUSTRY EXPANDING RAPIDLY: The shrimp industry of Panama is expanding rapidly with 1956 operations valued at well over \$5,000,000. There were 6 companies and some 100 boats engaged in shrimp operations at the end of the year. Five companies shipped frozen shrimp to world markets; the other dealer supplies the local and the Canal Zone markets with fresh shrimp. Exports for 1956 totaled 6.2 million pounds, an increase of 46 percent over 1955.

The average take of a boat per trip is 1,500 pounds and an average trip is 5 days. The maximum fishing depth of the present shrimp fleet does not exceed 50 fathoms. The large white shrimp forms about 80 percent of total exports. Shipments of small species, peeled and deveined, are increasing. The landings of pink shrimp, which is found in abundance in the Gulf for the short season of cold water (between 20°-30° C.), totaled 600,000 pounds in 1956 as compared to 100,000 pounds in 1955. The catch would have been larger had not the boats tied up for Holy Week.

A cooperative, with predominantly Panamanian capital and enjoying concessions extended under Law 12 of May 1950, dominates the industry. Its own fleet numbers 52 boats and a number of privately-owned boats are under contract. Its production, about three-quarters of the total, is all exported. Since its income is derived exclusively from foreign sales, its operations are tax free. The cooperative is presently constructing new and expanded facilities on Taboga Island where a deep-water cove will permit around-the-clock unloading and servicing of its boats. A fish-meal plant is completed and will initiate operations shortly with its own fleet of boats equipped for purse-seining. Unutilized fish of the shrimp boats and wastes of shrimp and fish fillet operations will also be used for reduction. The marine shops and storehouse now under construction will permit building, repair, and servicing of its own boats. Its 206-foot dry dock will

accommodate ships of 1,000 tons and permit repair of tuna boats fishing in this area. Its shrimp and packing operations will eventually be transferred to Taboga, but present facilities are being enlarged to permit brine-freezing of the large white shrimp for select trade.

A new shrimp company, owned jointly by Panamanian and United States capital, was organized in November and was expected to begin operations in 1957. The company will operate its own fleet and export frozen shrimp and lobster tails. It proposes to build a freezing plant with a daily capacity of 100,000 pounds of shrimp.

The Government has expressed concern over the uncontrolled fishing of shrimp and the possibility of exhausting this valuable resource.

Fish fillets are produced by several of the shrimp companies as a byproduct of the shrimp industry. Corbina, red snapper, and flounder are the principal fish used. The local market and the Canal Zone consume most of the production of about 1,000 pounds daily. Small quantities have been exported when available. There are no boats engaged solely in commercial fishing of these species.

The boat building industry has developed rapidly under protection of the law of 1954 which requires all boats engaging in fishing in Panamanian waters to be constructed in the Republic. Some 8 companies have been established in the last few years. The average boat is 60 to 65 feet and costs between \$17,000 and \$20,000 without motor. Construction in 1956 averaged a boat every two weeks. As of the end of the year there were 45 keels laid down and another 30 on order. Three companies are constructing steel boats, points out the United States Embassy in Panama in a dispatch dated May 10.



Peru

REVIEW OF THE FISHERIES, 1956: The total fish catch for Peru in 1956 appears to have been good.

The canned fish pack (including tuna and bonito) was approximately 1.8 million cases in 1956, as compared with 1.4 million cases in 1955. Rapidly increasing

labor costs and Japanese competition are, however, narrowing the margin of profit for canned fish. Peruvian canners shifted their main attention to the British and European market beginning in 1955, but Japanese canners began to move heavily into that market at the end of the year.

Frozen fish exports compared favorably with the previous year. Fish meal exports nearly doubled in 1956, reaching \$3.5 million f.o.b. in value.

Whaling (almost entirely sperm) showed no important change in respect to the kill, but work on the erection of a \$1-million sperm oil and meal plant began, and a fleet of three Norwegian catcher boats arrived in November.

Exports of fisheries products in 1956 were about \$15.4 million as compared with \$12.7 million in 1955. (United States Embassy dispatch from Lima.)



Portugal

CANNED FISH EXPORTS, JANUARY-MARCH 1957: For the first three months of 1957, canned fish exports amounted to

10,841 tons (570,500 cases), valued at US\$6.9 million. Sardines in olive oil exported during the first three months of 1957 amounted to 7,299 tons (384,200 cases), valued at US\$4.6 million.

Portuguese Canned Fish Exports, January-March 1957		
Product	Metric Tons	US\$
Sardines in olive oil	7,299	4,648
Sardinelike fish in olive oil ..	1,473	1,193
Sardines & sardinelike fish in brine	625	159
Tuna & tunalike in olive oil ..	189	169
Tuna & tunalike in brine	49	27
Mackerel in olive oil	930	553
Other fish.....	276	123
Total	10,841	6,872

tity and 68 percent of the value of all Portuguese exports of canned sardines in olive oil. Exports of sardines in olive oil for the first three months of 1957 to the United States amounted to 251 tons (valued at US\$208,000), while exports to the Philippines totaled 223 tons (US\$141,000).

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CANNED FISH PACK, JANUARY-MARCH 1957: The Portuguese light pack of canned sardines in oil of only 14 metric tons during March 1957 was due to the closed season on sardine fishing. The pack of all canned fish in March 1957 amounted to 692 tons, the July 1957 Conservas de Peixe reports.

The total pack of canned fish for January-March 1957 amounted to 3,823 tons as compared with 1,429 tons in the similar period of 1956. Canned sardines in oil (1,797 tons) accounted

Portuguese Canned Fish Pack, January-March 1955		
Product	Metric Tons	Canner's Value
In Olive Oil:		
Sardines	1,797	1,000
Sardinelike fish	529	1,109
Anchovy fillets	1,031	1,059
Tuna	60	50
Other species (including shellfish)	242	146
In Brine:		
Sardinelike fish	81	27
Other species	83	24
Total	3,823	2,731

for 47 percent of the January-March total pack, much higher than the pack of 532 tons for the same period in 1956.

CORRECTION: In the January 1957 Commercial Fisheries Review, p. 82, in the news item "Portuguese Canned Fish Pack, January-June 1956," all references to "cases" in the text should be corrected to read "tons."

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FISHERIES TRENDS, MAY 1957: Sardine Fishing: During May the Portuguese fishing fleet landed 7,923 metric tons of sardines (valued at US\$933,391 ex-vessel, or \$118 a ton). In May 1956, a total of 825 tons of sardines were landed with an ex-vessel value of US\$191,373.

Sardines purchased by the canneries during May amounted to 3,487 tons (valued at US\$449,391 ex-vessel or \$129 a ton), or 44 percent of the total landings. Only 3 tons were salted, and the balance of 4,433 tons, or 56 percent of the total, was purchased for the fresh fish market.

Other Fishing: The May 1957 landings of fish other than sardines consisted of 1,322 tons of anchovy and 1,987 tons of chinchard. (Conervas de Peixe, July 1957.)



Spain

VIGO FISHERIES TRENDS, JUNE 1957: Fish landings in the Vigo area in June were greater than in May. A good albacore tuna season is predicted. Most of the fish canneries resumed operations by the end of June, packing albacore and sardines.

Fishing: Fish catches landed at Vigo and sold through the local fish exchange in June amounted to 10.9 million pounds valued at 45,602,237 pesetas (US\$1,085,333) - an increase in volume of about 33 percent over the previous month and about 38 percent over June 1956.

The principal varieties landed at Vigo during June were horse mackerel, hake and small hake, albacore tuna, and a fish known locally as "gallo" (*Lepidorhombus boscii*). Sardine catches showed an improvement over May and amounted to 304,000 pounds. The sardines were found to be in a good condition for packing, but the June catches were below expectations.

Vigo's albacore fleet put out to sea during the second half of June and had fairly successful catches. For the present, a good albacore season is anticipated with catches higher than for 1956. A number of fishing vessels from the Cantabrian region (mainly from San Sebastian) unloaded their albacore catches at Vigo.

The canneries in the Vigo area were able to purchase the first catches of albacore at around 15.00 pesetas a kilogram (US\$320 a short ton) but higher prices are anticipated as the season develops.

Canning: The canneries in the Vigo area purchased 1.4 million pounds of fresh fish through the local fish exchange in June as compared with 0.4 million pounds for the previous month and 0.1 million pounds in June 1956.

The supply of olive oil continued adequate. However, tin plate was still scarce for canning operations. Although import permits for tin plate are being granted to the extent of the 20 percent of foreign exchange allowed on exports, this alone is insufficient.

Domestic and foreign markets for canned fishery products were dull during June. Stocks were low for the varieties in demand abroad and the prices for domestic consumption are probably from 10 to 15 percent higher than for the same period of 1956. The Catalonia district of Spain is the principal domestic market for canned fishery products. Albacore has a good foreign demand and it is anticipated that exports will be at a high level as soon as stocks are built up, states a July 6, 1957, dispatch from the United States Consul in Vigo.



Sweden

DEVELOPMENT OF FROZEN FISH INDUSTRY AND MARKETS: The marketing of quick-frozen fish in Sweden goes back to 1948 when one company in collaboration with a refrigerating company made a survey of the possibilities of producing and selling a first-class quick-frozen product. The general policy decided upon at that time was to give consumers

a guaranteed quick-frozen boneless fish in hygienic packing bearing a brand name. Today that company is by far the dominant Swedish producer of quick-frozen products. Developments following 1948 are described by the managing director of the company in an article appearing in the June 20 issue of Inblick, the company's house organ.

The director writes that over 10,000 retail shops in Sweden are now selling frozen fish. Consumption has increased year after year so that in 1956 it represented about 50 percent of the consumption of all frozen foodstuffs in Sweden. As a comparison he mentions that the consumption of frozen fish in England is calculated to correspond to 15 percent and in the United States to 8 percent of the consumption of all frozen foodstuffs.

Developments in this line were so rapid that as early as the beginning of the 1950's it was evident that it would soon become impossible to meet more than a fraction of the requirements for frozen fish by means of Swedish production. Further, consumers demanded new species of frozen fish, and therefore the company examined the possibilities of freezing a wider range of fish and taking more fish from neighboring countries.

The director also states that because of the continuously growing demand for frozen fish in Sweden, the company was encouraged to investigate the possibilities of getting fish, particularly cod and haddock, from Norway. In cooperation with a sister company, a fish filleting industry was erected at Hammerfest, at the northernmost point of Norway, and quick-freezing commenced in 1951. Fish that is frozen there is now being sold in Norway and Sweden as well as in other countries under the company's brand.

In 1956 the Hammerfest plant was considerably enlarged. Production capacity is now large enough to meet the greatly increased demand in various markets for frozen cod and haddock.

The Swedish company is now seeking to gain more export markets. A joint export sales organization was started last year in Sweden and also at Hammerfest, Norway. Efforts

have heretofore been concentrated mainly on Great Britain, but frozen products are also being exported to Austria, Germany, and other markets. The majority of the company's exports so far consist of vegetables, poultry, and berries from Sweden, but the sale of frozen fish from plants at Hammerfest and Frederikshavn are constantly increasing. The company meets serious competition on the export markets but, according to the director, production costs for frozen fish for instance in Norway for natural reasons are considerably lower than in Sweden and there is "every reason to view the possibilities of a continued success optimismistically."

The managing director's article also reveals that during the period January through April this year the Swedish company has produced at its Swedish plants about 750 metric tons of frozen cod fillets, corresponding to almost 60 percent of the total frozen quantity of Swedish cod fillets during that period.

At Varberg, Sweden, the Swedish company started production at the beginning of 1956. The assortment comprises frozen haddock, whiting, and mackerel. The Varberg plant employs about 20 persons.

At Trelleborg, Sweden, the company has collaborated with another company since the fall of 1951. Cod is landed and filleted in a building belonging to this other company. It is thereafter sent for cutting and freezing at Helsingborg, Sweden. This other also fillets fish at Simrishamn, Sweden, and cutting and freezing take place at Helsingborg.

At Västervik, Sweden, the Swedish started operations in January 1955. At this plant only Baltic herring is filleted and frozen by about 30 persons during the greater part of the year.



Tunisia

REVIEW OF THE FISHERIES, 1956: The Tunisian fish catch, never high in comparison with the catch of other Mediterranean countries, decreased in 1956. At the end of the year the Tunisian Government was planning a thorough survey of possible expansion of fisheries by a modernization of the fishing fleet, the installation of a refrigeration system, the purchase of larger fishing boats from abroad, and the training of Tunisian crews. The Government also plans to improve the fishing port of Mahdia.

Current problems facing the Tunisian fishing industry (which is operating now at about 45- to 50-percent capacity) are: departures of French fishing boat operators, lack of boats able to remain at sea for several days, untrained Tunisian crews, and limited refrigerating capacity. These problems make the industry a high priority objective for economic development. In the meantime the Tunisian Ministry of National Economy may be forced to permit local canneries with a total capacity of 11,000 to 12,000 tons to make contracts with Italian fishermen to assure adequate fish supplies.

Tunisian canneries, of which there are 20, are located at Tunis, Sidi, Daoud, Soliman, Sousse, and Mahdia. Sardines, sardinelles, and mackerel are shipped to France. Tuna is consumed locally, and production is not great enough to keep up with demand, necessitating imports from Norway, Sweden, and Italy.

One factory in Mahdia produced more than 50 percent of the total of 2,500 tons of sardines and sardinelles canned in 1956. About 800 tons of tuna largely for domestic consumption, were processed during the year. (U. S. Embassy dispatch from Tunis.)



U. S. S. R.

FISHING VESSELS TO EXPLORE SOUTH ATLANTIC FOR NEW FISHING GROUNDS:
A Russian scientific expedition which left Kaliningrad in former East Prussia for the South Atlantic on June 29 consists of two fishing vessels, one with a cold-storage hold and the other equipped with freezing plant to serve as a base.

The purpose of the expedition, according to a statement by the leader of the expedition, is to explore new fishing grounds. On board are a group of research workers from institutions in Kaliningrad and Moscow, and the crew are all experienced fishermen.

Work will start in the North Sea and proceed down into the Atlantic as far as the equator in an attempt to establish grounds with the biggest fish concentrations and the oceanographic conditions for such concentrations. In addition, various types of fishing gear are to be tried and modern radio-sounding equipment will be used.

The head of the scientific group said the expedition would carry out all-purpose research as far south as the Gulf of Guinea. (The Fishing News, July 26, 1957.)



United Kingdom

GUARANTEED MINIMUM PRICE PROPOSED FOR SCOTTISH AND IRISH WHITE FISH LANDINGS: A guaranteed minimum price is proposed for all landings of white fish in Scotland and Northern Ireland. Fishing vessels of 30 feet and over are to be registered and owners will pay a levy according to the amount of fish landed. And first-hand salesmen and buyers are to be registered.

These are the main provisions in a draft scheme, announced by the White Fish Authority (W. F. A.) in Edinburgh late in June. The scheme is designed to improve the marketing of surplus white fish in Scotland and Northern Ireland.

About 200 trawlers and 500 seine-net fishing boats in the area concerned will have to be registered with the W. F. A. under the scheme, if it is approved by Parliament.

The deputy chairman of W. F. A., and chairman of the Committee for Scotland-Northern Ireland suggested at a press conference that to finance the scheme a levy of 1d. (1.1 U. S. cents) a stone (14 lbs.) was likely on all fish landed. Registration of vessels would be nominal.

The scheme will attempt to introduce a more uniform return for catches and insure better use of surplus edible fish. No longer would surplus fish be dumped back into the sea.

The scheme evolved from proposals made by the Scottish producers, by trawler owners at Aberdeen and Granton, and by inshore fishermen around the coasts. For years their earnings have been seriously reduced by the failure to secure an adequate return on good, edible fish on days when the market is oversupplied. The scheme tries to introduce a greater

stability in first-hand prices and to give producers a more uniform return for their catches.

The scheme envisages greater development of processing.

The scheme provides for the fixing of minimum prices at first-hand sale and for more uniform returns to producers by payments for surplus fish which fail to find a market at or above the minimum price fixed for it.

These payments to producers will be guaranteed prices for fish gutted before being landed from a licensed vessel and "disposal prices" at lower rates for other surplus fish.

Compensation may also be paid at discretion for fish which is landed from a licensed vessel outside Scotland and Northern Ireland or which is offered for sale at any port or market in those countries for which minimum prices have not been fixed.

Payments to producers will be financed from a levy on fish landed and from the proceeds of the disposal of surplus fish. Different minimum guaranteed and disposal prices may be fixed for different varieties of fish: they may also differ as between ports or regions and they may be varied according to the uses to which the fish is put.

The scheme also provides for the licensing of salesmen selling fish at first hand, and of buyers who buy fish at first hand at special prices fixed for certain forms of processing. Particular vessels or persons may be exempted at discretion. A procedure is laid down for an appeal to the Minister in the case of a refusal or revocation of a license.

Surplus fish must be sold to a committee, who have assured the industry that it shall be disposed of through trade channels. The committee is given certain reserve powers to trade in and process surplus fish, but these powers may be exercised only after consultation with trade interests and with the approval of Ministers.

The text of the draft scheme defines surplus fish as white fish which being of legal size and fit for human consumption remains unsold after being offered for sale at first hand because the appropriate minimum price or more has not been offered.

The suggested levy is not to exceed 3d. (3.3 U. S. cents) a stone (14 lbs.) payable within seven days after the end of the week during which the white fish was landed.

The W. F. A. powers under the scheme are:

(a) To sell surplus fish for the manufacture of fish meal and other animal food and, with the approval of the Ministers,

for salting, smoke-curing, quick-freezing, vacuum-drying, canning, or other processing of fish;

(b) To manufacture fish meal from surplus fish and, with the approval of Ministers, to manufacture other animal food from surplus fish and to salt, smoke, cure, quick-freeze, vacuum-dry, can, and otherwise process surplus fish;

(c) To grade, pack, ice, store, transport, market, and advertise surplus fish or any product thereof where necessary; and

(d) To do such other incidental things, including the incurring of capital expenditure where necessary or desirable.

Licenses under the scheme will be renewable annually on January 1 at a fee of £1 (US\$2,80), points out The Fishing News of July 5, 1957.

Before fixing prices and the rate of levy, W. F. A. is required to publish its proposals and consider any written objections within 21 days.

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IMPORTS OF JAPANESE CANNED TUNA LIGHT: Although the British import quota for Japanese canned tuna and bonito for the period October 1, 1956-September 30, 1957, is about US\$1.4 million (ex-dock United Kingdom value), only very small quantities have been imported. Actual United Kingdom imports of Japanese canned tuna were only 200 pounds in all of 1956 and about 1,000 pounds from January-June 1957.

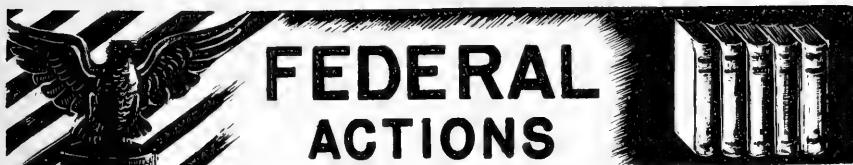
It is the opinion of officials in the Ministry of Agriculture, Fisheries, and Food that there is very little demand of the sort to encourage increased imports of Japanese tuna. It is believed that United Kingdom importers are satisfied with Peruvian packs of tuna or bonito, and show no disposition to seek other sources of supply. (United States Embassy dispatch from London dated August 16.)



FORTY-SEVEN SPECIES OF SHARKS IN WATERS OFF FLORIDA

Forty-seven species of sharks are known or suspected in the waters off Florida. Most are uncommon, and occur only in deeper water. The commercial species in inshore waters are the nurse shark, the lemon shark, blacknose shark, bull shark, sharpnose shark, and bonnet shark. The term "sand shark" is used to refer to a large group of sharks.

All sharks are potentially dangerous. Some sharks, shorter than 4 feet are not so dangerous as the longer and larger ones, but one should beware of any shark just to be sure. ("Sea Secrets," September 1957, The International Oceanographic Foundation, Coral Gables, Fla.)



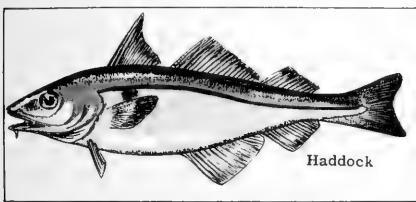
FEDERAL ACTIONS

Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

REVISED REGULATIONS FOR NORTH ATLANTIC HADDOCK AND COD FISHERIES:

Revised regulations governing the taking of haddock within Subarea 5 of the Northwest Atlantic Ocean by trawl fishermen under the jurisdiction of the



United States have been adopted and were scheduled to become effective on October 1, 1957, the Department of the Interior announced on September 4.

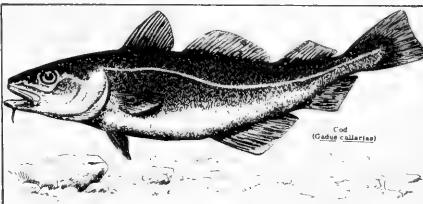


The changes were recommended by the International Commission for the Northwest Atlantic Fisheries, and involve mesh regulations for conservation purposes which permit the escape of

small haddock and cod for possible capture later when they are of a more profitable size.

Under existing regulations, haddock fishermen operating off the New England coast are required to use nets with mesh no smaller than 4.5 inches, but fishermen seeking other species who incidentally catch some haddock are exempt from the net restriction if their haddock take is less than 5,000 pounds or 10 percent of the total catch per trip. Under the revised regulations they also can be exempted from the net size limit if the take of haddock in their operations does not exceed 10 percent of all trawl-caught fish during any one year.

Cod fishermen for the first time are brought under the regulations and they



will also be required to use nets with mesh no smaller than 4.5 inches. Exemption rules similar to those for haddock will apply to the taking of cod incidentally with other species.

This annual exemption long has been desired by a large number of the New England trawl fleet operators who primarily fish for species other than haddock. Occasionally, because of weather, or other factors which reduced the balance of their normal catch, they had difficulty keeping within the trip exemption of 5,000 pounds of haddock or 10 percent of all the fish taken on the particular fishing trip. However, their annual average catch of haddock was under 10 percent of

the total take, and an alternative based upon the annual catch was requested.

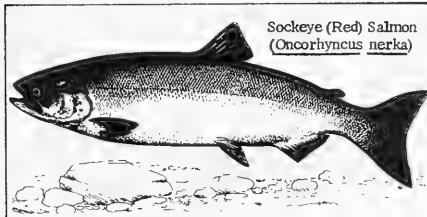
Subarea 5 which is involved is an area of the high seas lying off the coast of New England and is one of five separately described areas of the high seas covered by the International Convention for the Northwest Atlantic Fisheries, signed at Washington on February 8, 1949.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, JULY 1957, P. 40.

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**NORTH PACIFIC HIGH SEAS AREA
WHERE SALMON NET FISHING
IS PROHIBITED EXTENDED:**

Salmon net fishing by United States nationals is presently prohibited on the high seas off California, Oregon, Washington, and Alaska. Amendments, authorized by legislation approved July 24, 1957, will extend such protection to salmon on the high seas off British Co-



lumbia. The salmon runs are in progress at this time, and for their conservation it is imperative that protection on the high seas be extended throughout their range on the Pacific Coast immediately.

The North Pacific Fisheries Act, approved August 12, 1954 (68 Stat. 698; 16 U. S. C. 1021 et seq.) authorized the Secretary of the Interior to prohibit fishing by United States nationals on the high seas of the North Pacific Ocean in waters contiguous to the waters of Alaska. The area has been extended southward to latitude 48 degrees 30 minutes north by amendment of the act. Therefore, Part 130 of Subchapter F is amended to read as follows:

§130.1 Definition. The North Pacific area is defined to include all waters of the North Pacific Ocean and Bering Sea north of latitude 48 degrees 30 minutes west and east of longitude 175 degrees west exclusive of the waters of Alaska as defined in Part 101 of this subchapter.

§130.2 Salmon fishing prohibited, exception. No person or fishing vessel subject to the jurisdiction of the United States shall fish for or take salmon, except by trolling in the North Pacific area, as defined in this part: Provided, That this shall not apply to fishing for sockeye salmon or pink salmon south of latitude 49 degrees north.

These regulations became effective immediately upon publication in the Federal Register of July 27, 1957.

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**NOTICE OF INTENTION TO ADOPT
AMENDMENTS TO ALASKA COMMER-
CIAL FISHERIES REGULATIONS:**

Notice of intention to adopt amended regulations permitting and governing the time, means, methods, and extent of fishing for commercial fish and shellfish in waters of Alaska, was published in the Federal Register of July 25, 1957. The regulations are to become effective beginning about March 1, 1958, and to continue in effect thereafter until further notice.

Interested persons may participate in considering changes in the regulations by submitting their views, data, or arguments in writing to the Director of the Bureau of Commercial Fisheries, Department of the Interior, Washington 25, D. C., on or before November 22, 1957, or by presenting their views at a series of open discussions scheduled as follows:

Dillingham, Alaska--October 7, 1957
Anchorage, Alaska--October 9, 1957
Homer, Alaska--October 10, 1957
Kodiak, Alaska--October 12, 1957
Cordova, Alaska--October 14, 1957
Juneau, Alaska--October 21, 1957
Sitka, Alaska--October 22, 1957
Yakutat, Alaska--October 23, 1957
Ketchikan, Alaska--October 24, 1957
Petersburg, Alaska--October 25, 1957
Seattle, Wash.--November 13, 14,
and 15, 1957.

The hour and place of each meeting will be announced by the local representative of the U. S. Fish and Wildlife Service at the places indicated.



Federal Trade Commission

CONSENT ORDERS ISSUED ON PRICE-FIXING CHARGE AGAINST WEST COAST TUNA INDUSTRY:

Substantially all of the West Coast tuna industry on August 12 agreed to a Federal Trade Commission order to stop fixing prices for the tuna it produces--well over half of the nation's canned pack. The order also prohibits attempts to suppress competition in the industry, a Federal Trade Commission news release points out.

Named in the Commission's order are: (1) a fish cannery association and its members; (2) six associations of tuna boat owners; and (3) three area unions of fishermen and cannery workers.

In general, the order prohibits all of these groups from making agreements to fix and maintain prices. In addition, the association canners must not pursue any common course of action designed to curtail the volume or raise the price of imported tuna. The order also forbids the boat-owner associations and the unions from participating in illegally policing harbor areas with patrol boats for the purpose of fixing prices for the purchase or sale of fish.

In an accompanying opinion, the Commission accepted six agreements containing orders agreed to by the parties and the Commission's Bureau of Litigation. Five of these had been submitted to Hearing Examiner Earl J. Kolb, who rejected them as inappropriate. (He did not rule on the sixth agreement, involving a salmon trollers marketing Association because it was delayed in reaching him. Its terms, however, were identical with the boat owners' agreement that he had rejected.)

In rejecting the five agreements, the examiner said their provisos--or exemptions--detracted from the clarity and effectiveness of the orders.

The Commission disagreed with this opinion and said provisos similar to certain of them have been incorporated in judgments rendered by district courts or adopted in certain of its own previous orders.

The Commission continued: "Implicit in various of the provisos was recognition of the fact that the Fishermen's Cooperative Marketing Act and the Labor-Management Relations Act, 1947, sanction joint and collective activity in certain categories. We think that the provisos served to place the orders' injunctive provisions in proper perspective..."

However, the Commission emphasized that this should not be construed as general approval of exemptions being included in consent orders.

The Commission's complaint, issued August 29, 1956, had alleged that associations of tuna boat owners unlawfully negotiated with the canners to fix the prices paid for raw tuna. The three unions involved were charged with entering into working agreements with the boat owners on the basis of the illegally-fixed prices, while the canners were charged with conspiring among themselves to maintain fixed prices and suppress competition. The ultimate result of the conspiracies, the complaint had alleged, is that the public must pay more for tuna.

The complaint further charged, among other things, some of the parties conspired to prevent competition from the Japanese tuna industry.

The Commission dismissed its charges against six of the canning companies either because they are no longer in existence, are not engaged in canning tuna, or took no active part in the alleged illegal acts. The complaint also was dismissed against individuals, officers, directors, and representatives of the boat owners' cooperative associations, inasmuch as the Commission found they were acting only in their official capacities.

Under the order the canners are forbidden to enter into or continue any understanding, agreement, or planned common course of action to: Fix or maintain prices or establish terms for raw, frozen, canned, or imported tuna.

Refuse to sell canned tuna on consignment or compel others not to sell on this basis.

Negotiate with each other in buying or selling tuna for canning

Curtail the volume or raise the prices of imports.

Collect, for price-fixing purposes, reports showing their individual inventories, purchases, sales, etc. They may, however, collect information in any exporting country to present to any Federal or state agency or to Congress.

Other exemptions listed in the order for canners are these: They may individually negotiate price and terms with any fishing boat or any cooperative acting pursuant to the Fishermen's Cooperative Marketing Act.

Although they may contract with cooperatives to buy tuna caught by boats in which the canners have an interest, they must not exercise any control over the cooperatives in the marketing or sale of the fish inconsistent with their contract with the cooperatives.

Those owning fishing boats are not prevented from bona fide collective bargaining with boat employees or their union.

They may enter into or continue bona fide joint operations in buying from exporting countries. (This does not mean they can join together in a manner to make the Commission's order unenforceable.)

A canner may direct operations of its market-ers by the same interests if these operations do not result in any restraint of trade.

Under the order the boat owner associations are forbidden to enter into or continue any understanding, agreement, or planned common course of action to: Negotiate among themselves to fix or maintain prices or establish conditions for the sale or purchase of raw tuna.

Threaten, coerce, or compel, as a condition for the purchase of raw tuna, the purchase of any other raw fish, and vice versa. However, when a contract provides for the purchase of other fish in addition to future tuna catches, this shall not, in itself, be interpreted as violating the order.

Participate, financially or otherwise, in maintaining fixed prices by using patrol boats.

Curtail imports by any unlawful means.

Operate as a fishing boat association without having control over the marketing, sale, delivery, and disposition of the tuna caught by all members.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, SEPTEMBER 1956, P. 104.

Interstate Commerce Commission

INCREASED FREIGHT RATES AND CHARGES AUTHORIZED:

On August 6, 1957, the Interstate Com-merce Commission announced that all basic freight rates and charges, includ-ing charges for transportation of milk and cream in passenger-train service, but excluding refrigeration charges and charges for protective service against cold, may be increased, except as other-wise specifically provided, as follows: (1) within Eastern and Western territories 7 percent; (2) within Southern territory 4 percent; (3) interterritorially between Eastern and Western territories 7 percent; and (4) interterritorially be-

The order provides for the following other ex-emptions for boat owner associations: They are not prevented from using practices permitted by the Fishermen's Cooperative Marketing Act.

They properly may enforce contracts with members or purchasers of raw tuna caught by members.

Under the order the Unions are forbidden to enter into or continue any understanding, agreement, or planned common course of action to: Fix or maintain raw tuna prices.

Threaten, coerce, or compel, as a condition for the purchase of raw tuna, the purchase of any other raw fish, and vice versa. However, when a work-ing agreement provides for the catching of other fish in addition to tuna, this shall not, in itself, be interpreted as violating the order.

Negotiate among themselves for the sale or purchase of raw tuna.

Participate, financially or otherwise, in main-taining fixed prices by using patrol boats. How-ever, patrols may be used to enforce contracts be-tween the parties thereto pertaining to pay, hours, etc., of members.

Coerce buyers to pay fixed prices for raw tuna.

Other exemptions to the Unions are: They can individually buy or sell or individually bargain with any single buyer or seller.

Genuine collective bargaining is not prevented or any practices permitted by the Labor-Management Relations Act, 1947.

They may sell members' catches which cannot otherwise be disposed of under existing contracts.

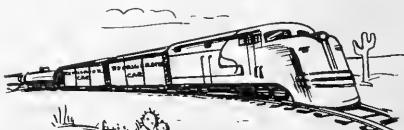
They may enforce contracts with buyers who fail to comply with terms.

The agreements, which formed the bases of the order, are for settlement purposes only and do not constitute admissions by the respondent parties therein that they have violated the law.



tween Southern and other territories 4 percent.

The Eastern territory lies mostly east of the Mississippi and north of the Ohio and Potomac Rivers; the Western territory, the entire region west of the



Mississippi; and the Southern territory, east of the Mississippi and south of the Potomac and Ohio Rivers.

These increases are in addition to interim increases previously authorized in the Commission's docket Ex Parte 206, and may become effective upon 15 days' notice.

The increases granted on August 6, 1957, plus the interim increases granted on December 17, 1956, in the Eastern and Western territories and on February 4, 1957, in the Southern territory are as follows: (1) Eastern territory 14 percent; (2) Western territory and between Eastern and Western territories 12 percent; and (3) within, from, and to Southern territory 9 percent.

One specific exception to the increases referred to above was made

for canned fishery products. The full percentage increases were not authorized for such products since the Commission specified a "hold-down" which limits the increase on any canned fishery product rate to \$0.11 a hundred pounds. This in effect authorizes a lower average percentage increase on these products which are shipped primarily over a long and relatively more costly haul from west coast to eastern markets.

Indications are that eastern and western railroads will place the major part of the increases into effect, but at least one southern railroad has indicated that relatively few of the increases authorized in its area will be placed into effect on its traffic.



Federal Trade Commission

INVESTIGATION INITIATED ON EFFECTS OF TUNA IMPORTS ON DOMESTIC TUNA INDUSTRY:

An investigation of the effects of tuna imports on the domestic tuna industry

has been initiated by the U. S. Tariff Commission at the request of the Senate Committee on Finance. The announcement of the investigation as it appeared in the August 30 Federal Register follows:

TARIFF COMMISSION

TUNA FISH

NOTICE OF SUPPLEMENTAL INVESTIGATION

Pursuant to a resolution adopted by the Committee on Finance, United States Senate, on August 20, 1957, the United States Tariff Commission, on the 26th day of August, 1957, instituted an investigation under the provisions of section 332 of the Tariff Act of 1930, as amended, with respect to tuna fish, supplemental to the investigation under section 332 made by the Commission pursuant to a Finance Committee Resolution of June 26, 1952.

On March 20, 1953, the Commission submitted to the Finance Committee a report of the results of its investigation with respect to tuna fish in response to that Committee's resolution of June 26, 1952. In its resolution of August 20, 1957, the Committee instructed the Commission "to make a supplementary investigation similar in scope to the investigation made in accordance with the Committee resolution of June 26, 1952, and to report the results of its supplementary investigation to the Committee on or before February 1, 1958."

The resolution of August 20, 1957 directs the Commission to hold a public hearing in the course of the supplementary investigation at which all interested parties shall be given opportunity to appear and be heard with regard to the subject matter of the investigation. The time and place of such hearing will be announced at a later date.

Issued: August 27, 1957.

By order of the United States Tariff Commission.

[SEAL]

DONN N. BENT,
Secretary.



White House

U. S. COMMISSIONER APPOINTED TO GREAT LAKES FISH- ERIES COMMISSION:

Director Donald L. McKernan of the Bureau of Commercial Fisheries, United States Fish and Wildlife Service, was appointed by the President as a member of the Great Lakes Fisheries Commission in August 1957. The appointment fills the vacancy left by the

resignation of John L. Farley. Other United States members of the Commission are Lester P. Voight and Claude Ver Duin.



Eighty-Fifth Congress (First Session)

Public bills and resolutions which directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to commit-



tees, pertinent legislative actions, hearings, and other chamber actions by the House and the Senate, as well as signature into law or other final disposition, are covered.

CONGRESS ADJOURNS: The first session of the 85th Congress adjourned sine die on August 30, 1957. The second session will be convened January 7, 1958. All legislation before either the Senate or House will remain in its status as of adjournment and will be subject to further consideration upon the convening of the second session.

ALASKA FISHERIES RESOURCES CONSERVATION: S. 2349 (Magnuson), a bill to facilitate the conduct of fishing operations in the Territory of Alaska, to promote the conservation of fishery resources thereof, and for other purposes. Reported by the Senate Committee on Interstate and Foreign Commerce (S. Rept. No. 963) on August 14. As reported all features of the bill are eliminated except for Section (a) of the bill which would repeal the requirement for a 50-percent salmon escapement now in existing law.

S. 2349 passed by the Senate on August 20 with amendment that repeals section 2 of the White Act approved June 6, 1924 (43 Stat. 464, 465; 48 U.S.C., 1953, 225) that provides for a minimum salmon escapement of 50 percent. Other provisions of the original bill were deleted as reported by the Committee.

Senate Report No. 963, Repeal of Escapement Provisions of Alaska Salmon Fishery Act of 1924, to accompany S. 2349, 5 pp., printed, August 14, 1957, Committee on Interstate and Foreign Commerce, 85th Congress, 1st Session. Contains a summary of Committee actions and discusses the purpose of the bill, changes in existing law, and a statement by the Assistant Secretary of the Interior for Fish and Wildlife.

H. R. 9280 (Tollefson) introduced in the House on August 14 and referred to the Committee on Merchant Marine and Fisheries includes only that part of S. 2349 that refers to Section (a) repealing

the provision in existing law that requires a minimum salmon escapement of 50 percent. Reported favorably by the House Committee on Merchant Marine and Fisheries on August 15. Passed by the House on August 22.

H. R. 9280 was passed by the Senate in lieu of S. 2349 on August 30 and cleared for the President. Signed by the President on September 4, 1957 (Public Law 85-296). Repeals section 2 of the Act of June 6, 1924 (43 Stat. 464, 465; 48 U. S. C., 1952 edition 225), which provides that in all waters of Alaska, in which salmon runs can be counted or estimated with substantial accuracy, there shall be allowed to escape not less than 50 percent of the total run.

S. 2805 (Magnuson) introduced in the Senate on August 16, a bill to facilitate the conduct of fishing operations in the Territory of Alaska, to promote the conservation of fishery resources thereof, and for other purposes; to the Committee on Interstate and Foreign Commerce. This bill is similar to S. 2349 (Magnuson) except that it does not include section (a) of S. 2349, which section was passed by Congress as H. R. 9280 and signed by the President on September 4 (P. L. 85-296). S. 2805 includes the portions of S. 2349 that authorizes the Secretary of the Interior to determine a particular period or periods of time each week, totaling not less than 36 hours, as closed periods for the taking of salmon except by prescribed methods; would prohibit the taking of salmon for commercial purposes by certain methods presently in use; would prohibit the possession or disposal of illegally taken fish, and would establish certain penalties for violations. Also included, is the provision to bar fishing for commercial purposes in any of the streams, creeks, or rivers of Alaska within 500 yards of the mouth except for the Karluk, Yukon, Ugashik, and Kuskokwim Rivers.

ALASKA STATEHOOD: S. 49, providing for admission of Alaska into the Union, passed by the Senate on August 30, 1957.

Senate Report No. 1163 Part 2, Providing for the Admission of the State of Alaska into the Union, to accompany S. 49, 3 pp., printed August 30, 1957, Committee on Interior and Insular Affairs, 85th Congress, 1st Session. This report summarizes the minority views which essentially are that Alaska statehood is undesirable because of the distance from the mainland, and that statehood for Alaska would set a precedent that would eventually be used to grant statehood to all other territories, however remote from the mainland in distance, culture, and economics.

Statehood for Alaska (Hearings before a Subcommittee of the Committee on Interior and Insular Affairs, House of Representatives, Eighty-Fifth Congress, First Session, on H. R. 50 and others), 499 pp., printed. Contains statements submitted during the hearings by Government agencies and the public.

Alaska Statehood (Hearings before the Committee on Interior and Insular Affairs, United States Senate, Eighty-Fifth Congress, First Session, on S. 49, a bill to provide for the admission of the State of Alaska into the Union; S. 35, a bill to provide that the Governor and the Secretary of the Ter-

rietary of Alaska shall be elected by the people of that Territory, March 25 and 26, 1957), 158 pp., printed. Contains statements submitted during the hearings by Government agencies and the public.

ALASKA TIDAL WATERS: H. R. 6760, a bill granting the Territory of Alaska title to certain lands beneath tidal waters. Passed by the Senate on August 26, with amendments, and sent back to the House.

The House passed the bill on August 28 with the Senate amendments and cleared it for the President. Signed by the President on September 7, 1957 (Public Law 85-303). Grants to Alaska all the right, title, and interest of the United States in and to all lands, including improvements thereon and natural resources (but excludes fishery resources) thereof, lying offshore of surveyed town-sites in the Territory, between the line of mean high tide and the pierhead line. Upon the acceptance by the Secretary of the Interior at any future time of the survey of any other townsite in the Territory, all the right, title, and interest of the United States in and to the lands, including improvements thereon and natural resources thereof, lying offshore of that surveyed townsite, between the line of mean high tide and the pierhead line, shall pass to the Territory. "Natural resources" includes, without limiting the generality thereof, oil, gas, and all other minerals, but does not include fish, shrimp, oysters, clams, crabs, lobsters, sponges, kelp, and other marine animal and plant life, or waterpower, or the use of water for the production of power.

ANTIDUMPING ACT OF 1921: H. R. 6006 (Cooper), a bill to amend certain provisions of the Antidumping Act of 1921, to provide for greater certainty and speed, and efficiency in the enforcement thereof, and for other purposes; reported to the Whole House by the Committee on Ways and Means (H. Rept. No. 1261) on August 27.

House Report No. 1261, Antidumping Act, 1921, to accompany H. R. 6006, 20 pp., printed, August 27, 1957, Committee on Ways and Means, 85th Congress, 1st Session. Explains the purposes and scope of the bill, its principal features, and analyzes the changes proposed in the bill from the original Act. The principal change in the Antidumping Act of 1921 which would be made by H. R. 6006 involves amendment of the definition of "foreign market value" in section 205 of the act so as to permit the use of prices of "restricted" sales in the determination of foreign market value. This amendment would bring the definition of "foreign market value" into conformity with the definition of "face value" in the Treasury Department regulations. Also shows the existing law together with the proposed changes and amendments.

COMMERCIAL PRODUCTION OF FISH ON RICE LANDS: S. 1552 (Fulbright), a bill to authorize the Secretary of Interior to establish a program for the purpose of carrying on certain research and experimentation to develop methods for the commercial production of fish on flooded rice acreage in rotation with rice field crops, and for other purposes; with amendment. Approved by the House Committee on Merchant Marine and Fisheries (H. Rept. No. 1212) on August 21 and referred to the Committee of the whole House on

the State of the Union. (The bill had previously been passed by the Senate on August 5 with an amendment that changed the authorization from the Secretary of Agriculture to the Secretary of the Interior.) S. 1552 was passed over by the House on August 28, 1957.

House Report No. 1212, Fish Farming, to accompany S. 1552, 4 pp., printed, August 21, 1957, Committee on Merchant Marine and Fisheries, 85th Congress, 1st Session. Contains favorable statements by the departments of the Interior and Agriculture plus the amendments made in S. 1552 by the House Merchant Marine and Fisheries Committee.

CONTRACT CARRIER REVISED DEFINITION: S. 1384, introduced in the Senate in February and H. R. 8825, introduced in the House in July; bills to revise the definition of contract carrier by motor vehicle as set forth in section 203 (a) (15) of the Interstate Commerce Act, and for other purposes. The bills would limit contract truck use by redefining the term "contract carrier" as presently defined under the Interstate Commerce Act. Both bills were passed by their respective houses, but S. 1384 was substituted for H. R. 8825 in its final passage in the House on August 16, 1957.

S. 1384 was signed by the President on August 22, 1957 (P. L. 85-163). This law limits the use of exempt trucks and revises the definition of the term "contract carrier by motor vehicle" in paragraph (15) of section 203 (a) of the Interstate Commerce Act, so as to state that the services performed by such a carrier are to be under continuing contracts with one person or a limited number of persons either (a) through the assignment of motor vehicles for a continuing period of time to the exclusive use of each person serviced, or (b) by the furnishing of transportation services designed to meet the distinct need of each individual customer. Other provisions give the Interstate Commerce Commission authority in granting future contract carrier authorizations to include such terms, conditions, and limitations respecting the person or persons on the number or class for which a contract carrier may perform transportation services as may be necessary to assure that the contract carrier will remain within the scope of his permit, and gives the Commission authority to limit the number of contracts which a contract carrier may have.

House Report No. 970, Revising Definition of Contract Motor Carrier under Section 203 (a) (15) of Interstate Commerce Act, to accompany H. R. 8825, 13 pp., printed, August 2, 1957, Committee on Interstate and Foreign Commerce, 85th Congress, 1st Session. Discusses the need for and purpose of the legislation, explains the reported bill (H. R. 8825) and changes in the existing law, presents definitions, and prints a favorable report from the Interstate Commerce Commission.

FISH HATCHERY: The House Committee on Merchant Marine and Fisheries' Subcommittee on Fisheries and Wildlife Conservation ordered favorably reported on August 8 to the full committee H. R. 662, to establish a fish hatchery in the State of Pennsylvania. Reported favorably by the full committee on August 14, 1957; passed the House on August 28 and sent to the Senate without amendment.

S. 2781 (Martin) introduced in the House on August 14, a bill to provide for the establishment of a fish hatchery in the northwestern part of the State of Pennsylvania; to the Committee on Interstate and Foreign Commerce.

FISHING VESSEL RIGHTS ON THE HIGH SEAS: H. R. 5526 (Bonner), a bill to amend the Act of August 27, 1954 (68 Stat. 883), relating to the rights of vessels of the United States on the high seas and in the territorial waters of foreign countries. (Provides for compensation to injured seamen of United States vessels when illegally seized on the high seas.) The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries ordered the bill as amended favorably reported to the House on August 14 by the Committee on Merchant Marine and Fisheries. Other House bills—H. R. 5886, H. R. 5943—are replaced by H. R. 5526.

S. 1483, a companion Senate bill to H. R. 5526, was favorably reported to the Senate by the Committee on Interstate and Foreign Commerce on July 25. The bill was debated on the Senate floor on August 23 and passed over on August 30.

To Protect Rights of United States Vessels on High Seas (Hearing before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-Fifth Congress, First Session, on H. R. 5526, a bill to amend the act of August 27, 1954 (68 Stat. 883), relating to the rights of vessels of the United States on the high seas and in the territorial waters of foreign countries, April 17, 1957), 80 pp., printed. Presents the text of the bill and the testimony of Government officials, members of Congress, fishery associations, and members of the fishing industry.

FUR-SEAL CONVENTION: Interim convention on conservation of North Pacific fur seals, signed at Washington February 9, 1957, in behalf of Canada, Japan, U. S. S. R., and U. S. (Ex. S. 85th Cong., 1st sess.) was ratified by the Senate on August 8.

HAWAII STATEHOOD: Statehood for Hawaii (Hearings before the Subcommittee on Territorial and Insular Affairs of the Committee on Interior and Insular Affairs, House of Representatives, Eighty-Fifth Congress, 1st Session, on H. R. 49 and other related bills—H. R. 339, H. R. 628, H. R. 848, H. R. 1243, and H. R. 1246, providing for the admission of Hawaii into the Union, April 8, 9, and 16, 1957) 160 pp., printed. Contains statements submitted during the hearings.

Statehood for Hawaii (Hearings before the Committee on Interior and Insular Affairs, United States Senate, Eighty-Fifth Congress, First Session, on S. 50, a bill to provide for the admission of the State of Hawaii into the Union; and S. 36, a bill to provide for the election of the Governor and Secretary of the Territory of Hawaii by the people of the Territory; for the appointment by the Governor of the justices and judges of the courts of the Territory; and for the formation of a constitutional government by the people of the Territory, April 1 and 2, 1957), 115 pp., printed. Contains statements submitted during the hearings.

Senate Report No. 1164 Part 2: Providing for the admission of the State of Hawaii into the Union. Minority views to accompany S. 50, 3 pp., printed, August 30, 1957, Committee on Interior and Insular Affairs, 85th Congress, 1st Session. The reasons given for opposing passage of S. 50 were similar to those stated in opposition to S. 49, Alaska statehood.

LOAN FUND FOR FISHERIES: S. 2720 (Magnuson and Payne), to amend the Fish and Wildlife Act of 1956 in order to increase the authorization for the fisheries loan fund established under such act; to the Committee on Interstate and Foreign Commerce; introduced in the Senate August 6.

Reported with an amendment by the Senate Committee on Interstate and Foreign Commerce on August 16 (Rept. No. 982). The amendment decreases the additional amount of money requested from \$10 million to \$3 million. Passed by the Senate on August 20 as amended by the Committee. Makes the total amount authorized for this fund \$13 million.

Senate Report No. 982, Increasing Fisheries Loan Fund authorization under Fish and Wildlife Acts of 1956, to accompany S. 2720, 3 pp., printed, August 16, 1957, Committee on Interstate and Foreign Commerce, 85th Congress, 1st Session. Contains a statement of the purpose of the bill and the status of the Fisheries Loan Fund as of August 12, 1957.

RESOURCE DEVELOPMENT PROJECTS DATA: S. Res. 148, expresses the sense of the Senate with respect to the kind of information that ought to be provided by the executive agencies to Congress on proposed land and water development projects. Reported jointly on August 28 by the Senate Committee on Interior and Insular Affairs and Senate Committee on Public Works, together with minority views (S. Rept. 1154).

SAFETY OF LIFE AT SEA: Amendment to international convention for the safety of life at sea, signed at London on June 10, 1948 (Ex. M, 85th Cong. 1st, Sess.) was ratified by the Senate on August 8, 1957. Ratified by the President August 30, 1957.

Senate Executive Report No. 9, Amendment Recommended to the International Convention for the Safety of Life at Sea, to accompany Executive M, 2 pp., printed, July 26, 1957, Committee on Foreign Relations, Eighty-Fifth Congress, 1st Session. Gives the purpose of the amendment which is to remove a prohibition against the use of inflatable liferafts on vessels. The removal of this restriction was recommended by the Committee.

SALMON AND HALIBUT PREDATOR BOUNTY: S. 2719 (Magnuson), to provide for the payment of bounties for the control of certain predators on salmon and halibut of the Pacific coast and Alaska; to the Committee on Interstate and Foreign Commerce; introduced in the Senate August 6. This bill authorizes the Secretary of the Interior to pay bounties on certain so-called predators reported to prey on salmon and halibut along the Pacific coast and in Alaskan waters. The bounties proposed are: (1) \$10 a ton for unlevered dogfish sharks, or 10 cents a pound for dogfish livers; (2)

\$20 a ton for lamprey eels taken from the Columbia River and other rivers of the Pacific Coast; and (3) \$40 a ton for hair seals and sea lions. Also authorizes the Secretary to initiate programs of control with respect to beluga whales and other predators of the salmon resources of Alaska, including such fish-eating birds as he determines to be destructive to such resources.

SALMON FISHERIES CONVENTION: Protocol between United States and Canada to the convention for protection, preservation, and extension of sockeye salmon fisheries in the Fraser River System, signed at Washington on May 26, 1930, which protocol was signed at Ottawa on December 28, 1956 (*Ex. C, 85th Cong., 1st Sess.*) was ratified by the Senate on August 8. The protocol amends the sockeye Salmon Fishery Act of 1947 so as to extend regulatory authority of the International Pacific Salmon Fisheries Commission to include pink salmon. The enabling legislation was enacted into law (*P. L. 85-102*) on July 12, 1957.

SHRIMP AND FISH STUDIES IN TEXAS WATERS: H. R. 9353 (Young), introduced in the House on August 19, a bill to authorize continuing studies of the biology, propagation, catch, and abundance of species of fish and shrimp that are of interest to sport and commercial fishermen in waters adjacent to certain areas in the State of Texas so that appropriate measures for protecting the environment and increasing the abundance of such species of fish and shrimp may be taken; to protect the whooping cranes and the lands upon which it is dependent by the establishment of a wildlife sanctuary in the State of Texas, and for other purposes; to the Committee on Merchant Marine and Fisheries.

S. 2886 (Yarborough) introduced in the Senate on August 29 and referred to the Senate Committee on Interstate and Foreign Commerce. Similar to H. R. 9353.

SMALL BUSINESS TAX RELIEF: H. R. 9427 (Hold), introduced in the House on August 23, a bill to provide a minimum initial program of tax relief for small business and for persons engaged in small business; to the Committee on Ways and Means. Six or more similar bills have previously been introduced.

TRADE ADJUSTMENT ACT: S. 2907 (Kennedy), introduced in the Senate on August 30, a bill to provide assistance to communities, industries, business enterprises, and individuals to facilitate adjustments made necessary by the trade policy of the United States; to the Committee on Finance. The proposed legislation would be triggered by the escape clause of the Trade Agreement Act of 1951. When the Tariff Commission recommended to the President that a particular industry was being se-

riously affected, the President could either restore tariffs, impose quotas, or do nothing. In the latter event, he would turn the case over to a five-member Trade Adjustment Board, provided for by the bill, which would invoke the provisions of this act to aid the injured parties.

TRADE AGREEMENTS PROGRAM: Administration and Operation of Customs and Tariff Laws and the Trade Agreements Program (Hearings before the Subcommittee on Customs, Tariffs, and Reciprocal Trade Agreements of the Committee on Ways and Means, House of Representatives, 84th Congress, Second Session, Part 4, November 26-December 13, 1956 and December 4-6, 1956), 376 pp., printed. Digests of conferences held in Europe and Japan and statements and documents received. Includes briefing material on tuna submitted to Subcommittee members in Japan; a summary of the statement of the Vice Director of the Japanese Fisheries Agency; statements by the Japanese Minister of Foreign Trade and Industry and International Trade and Industry; memoranda submitted by the Japanese tuna packing industry.

TUNA IMPORT ACT: S. 2734 (Magnuson and Kuchel), introduced in the Senate on August 8, a bill to amend the Tariff Act of 1930, to regulate the importation of all tuna commodities with equivalence to the Committee on Finance. H. R. 9237 (King), H. R. 9244 (Wilson) and H. R. 9243 (Utt), are similar bills introduced in the House on August 13 and referred to the House Committee on Interstate and Foreign Commerce. The bill to be known as "The Tuna Import Act of 1958," would establish quotas on both frozen and canned tuna and proportion the domestic market between the United States and Japan catches. Tariffs are provided for different volumes of frozen tuna and establishes the tariff on canned tuna in brine at the same level as the tariff on canned tuna in oil, and brings the tariff on cooked tuna loins and discs to an equivalent tariff level.

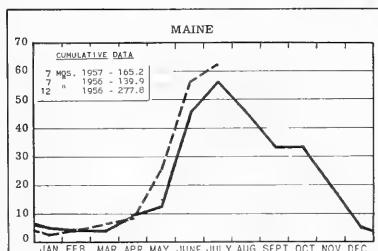
WHALING CONVENTION: Protocol to international convention for regulation of whaling, signed at Washington on December 2, 1946, which protocol was signed at Washington on November 19, 1956, for U. S. and 16 other governments (*Ex. E, 85th Cong., 1st Sess.*) was ratified by the Senate on August 8.

Senate Executive Rept. No. 8, Protocol to the International Convention for the regulation of whaling, to accompany Executive E, 11 pp., printed, July 26, 1957, 85th Congress, 1st Session. Describes the purpose and background of the protocol and committee action and recommendations. The protocol would amend article II to include helicopters within the framework of the regulations and article V pertaining to "methods of inspection" to add a neutral observer to each factoryship.

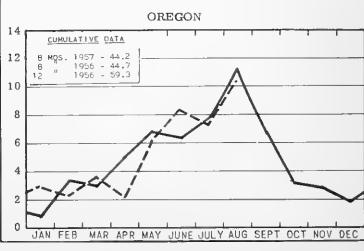
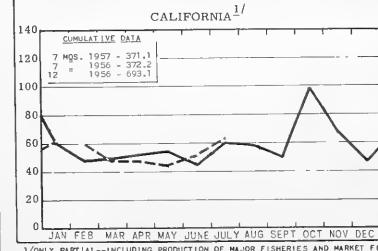
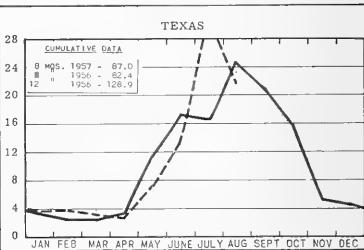
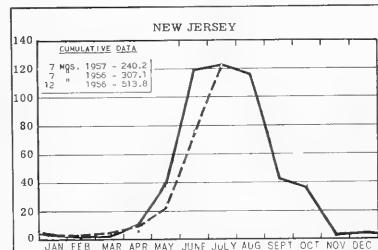
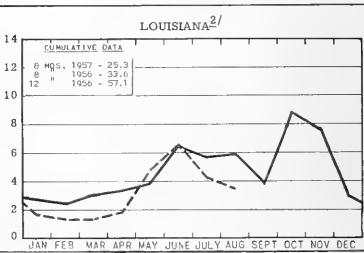
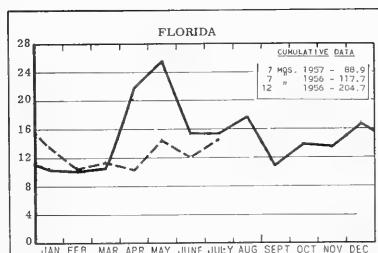
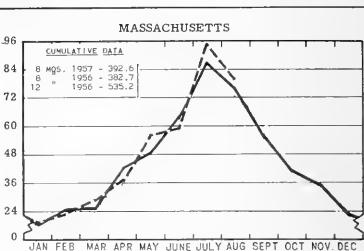


FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES
In Millions of Pounds



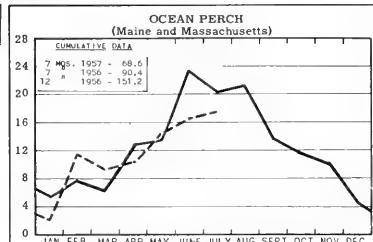
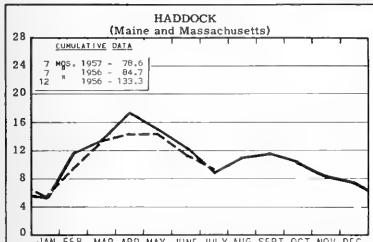
LEGEND:
— 1957
- - 1956



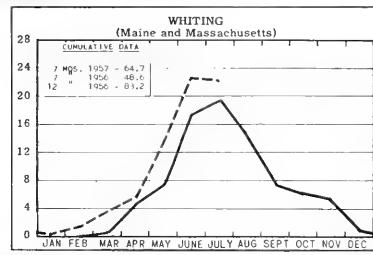
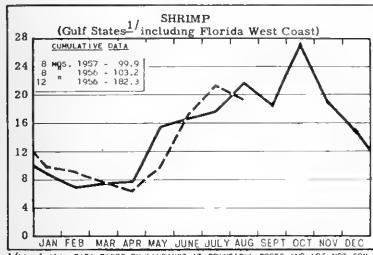
1/ ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

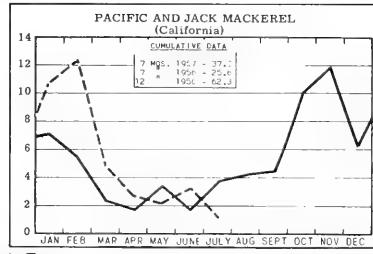
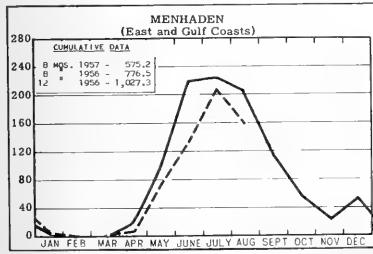


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

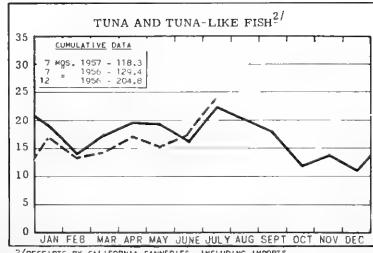
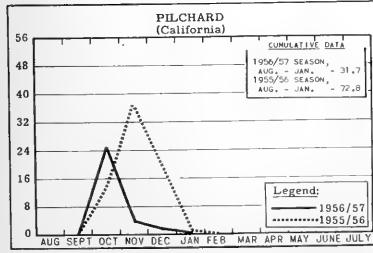
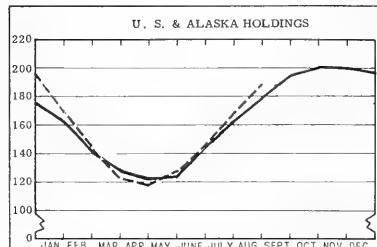
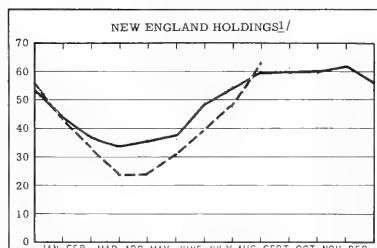
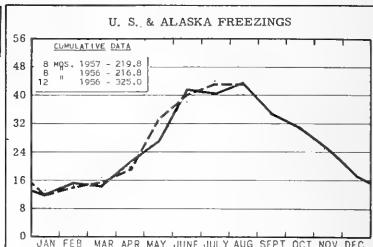


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

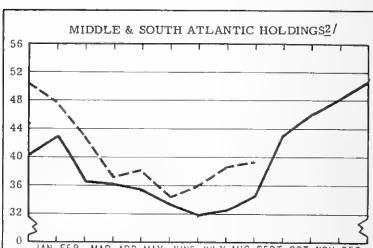
In Millions of Pounds



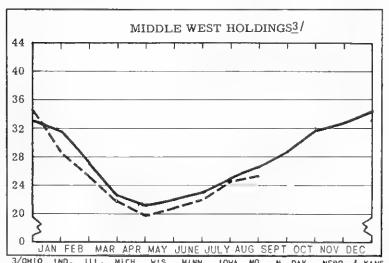
LEGEND:
— 1957
- - - 1956



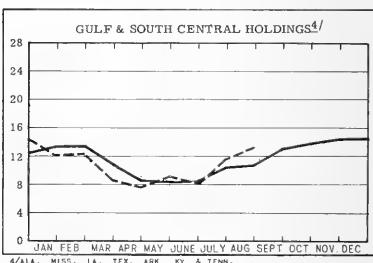
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.



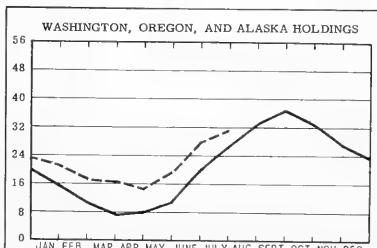
^{2/}ALL EAST COAST STATES FROM N.Y. SOUTH.



^{3/}KANS., NEBR., IOWA, MO., MINN., WIS., MICH., ILL., IND., AND OHIO.



^{4/}ALA., MISS., LA., TEX., ARK., KY., TENN.



*Excludes salted, cured, and smoked products.

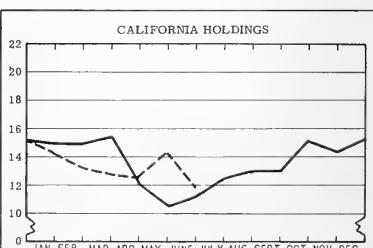
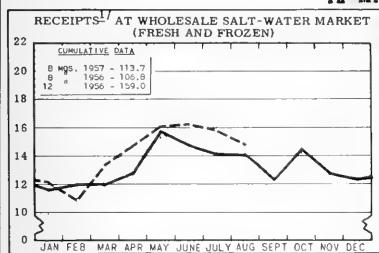


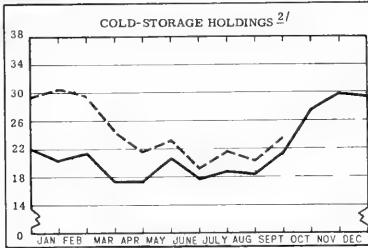
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

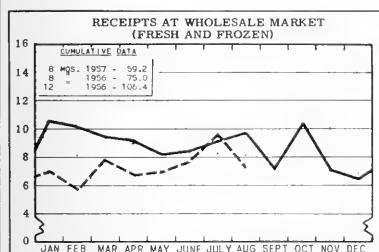


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

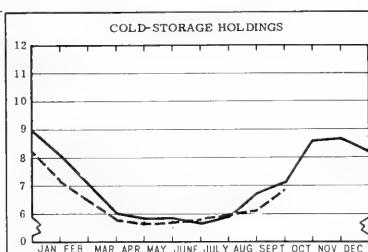
NEW YORK CITY



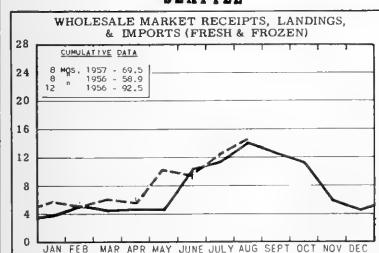
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



SEATTLE



LEGEND:
— 1957
- - - 1956

BOSTON

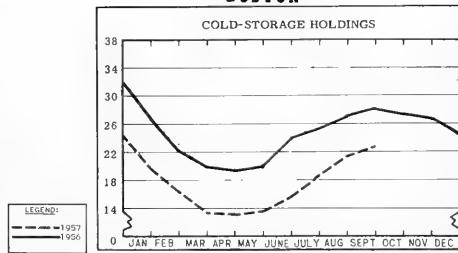


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

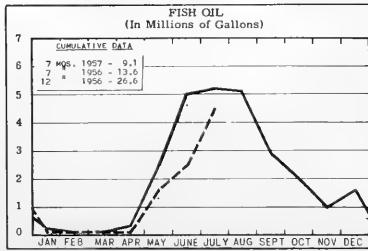
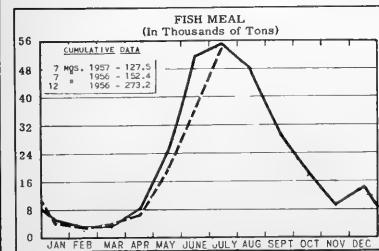
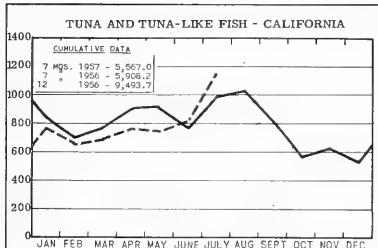
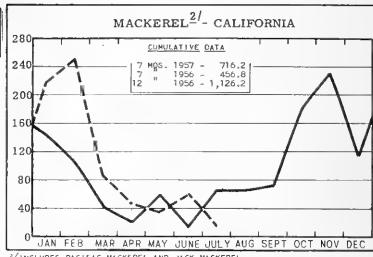


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

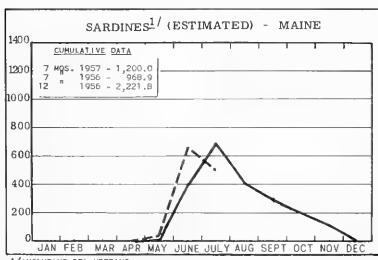
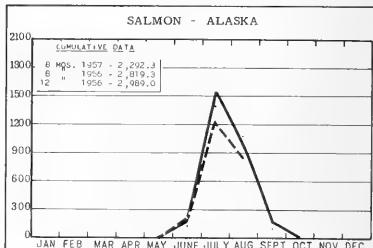
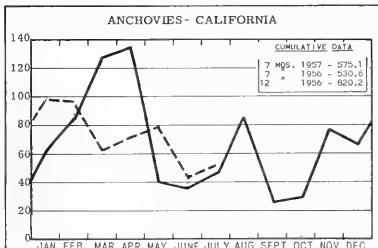
In Thousands of Standard Cases



LEGEND:
— 1957
— 1956



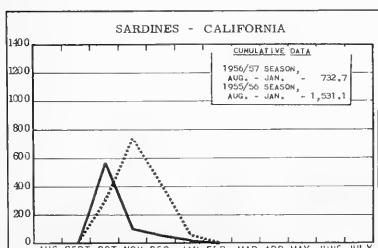
^{1/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	½ drawn	3½ oz.
SHRIMP.....	48	--	5 oz.
TUNA	48	No. ½ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	½ lb.	8 oz.



Legend:
— 1957/58
— 1956/57
····· 1955/56

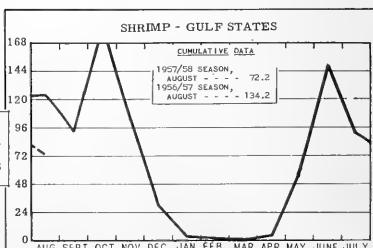
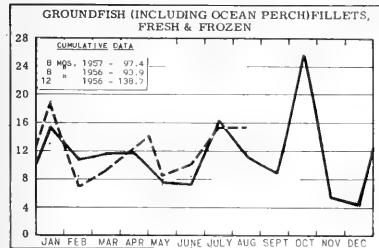


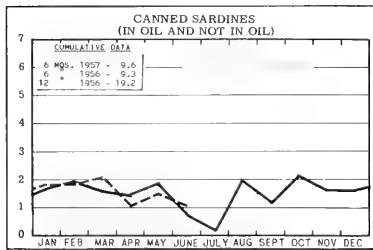
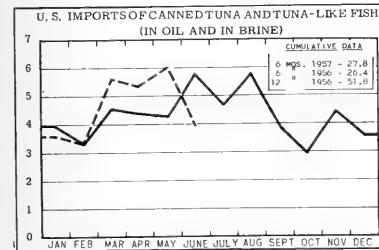
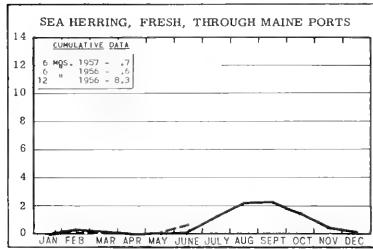
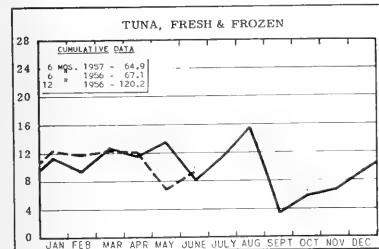
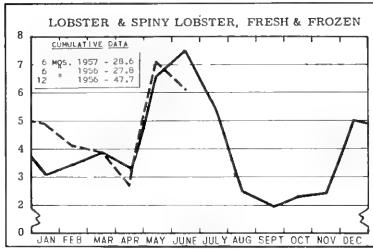
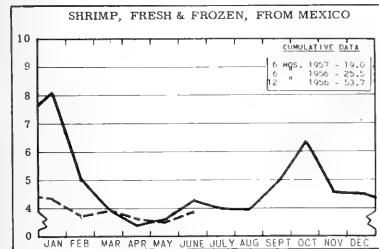
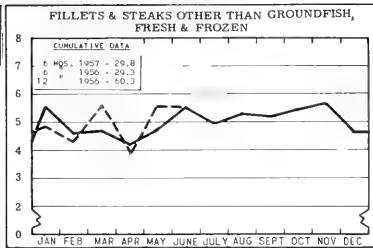
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



LEGEND:

— 1957
- - 1956





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES
CFS-A - CURRENT FISHERY STATISTICS OF ALASKA
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS
SSR - FISH, - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION)
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-1567	- South Carolina Landings, April 1957, 2 pp.
CFS-1568	- Georgia Landings, April 1957, 2 pp.
CFS-1577	- Fish Meal and Oil, May 1957, 2 pp.
CFS-1581	- Rhode Island Landings, April 1957, 3 pp.
CFS-1585	- North Carolina Landings, May 1957, 4 pp.
CFS-1587	- California Landings, March 1957, 4 pp.
CFS-1593	- New Jersey Landings, May 1957, 4 pp.
CFS-1594	- Texas Landings, May 1957, 3 pp.
CFS-1596	- California Landings, April 1957, 4 pp.
CFS-1597	- Maine Landings, May 1957, 5 pp.
CFS-1598	- Rhode Island Landings, May 1957, 3 pp.
CFS-1600	- New York Landings, May 1957, 4 pp.
CFS-1601	- Alabama Landings, May 1957, 2 pp.
CFS-1602	- Fish Stick Report, April-June, 1957, 2 pp.
CFS-1605	- North Carolina Landings, June 1957, 3 pp.
CFS-1606	- Alabama Landings, June 1957, 2 pp.
CFS-1607	- Georgia Landings, June 1957, 2 pp.
SL-161	- Producers of Packaged Fish, 1956 (revised), 6 pp.

SSR-Fish. No. 203 - Longline and Troll Fishing for Tuna in the Central Equatorial Pacific, January 1955 to February 1956, 43 pp., illus., February 1957.

SSR-Fish. No. 212 - Central North Pacific Albacore Surveys, May to November 1955, by Joseph J. Graham, 44 pp., illus., April 1957. Describes an investigation of the albacore tuna,

Germo alalunga (Bonnaterre), resources to the north and northeast of the Hawaiian Islands, during May-November 1955. It was found that albacore were scarce in these areas during the late spring and were abundant during the late summer. The summer distribution was probably discontinuous from east to west with concentrations in the central and eastern North Pacific sectors and a lack of fish in between. During the fall albacore were relatively abundant in this intervening area suggesting that the discontinuity was either a transient condition or had diminished somewhat with the change in season. Catches of surface-swimming albacore were associated with the Polar Front, a transition zone between central and subarctic waters. Surface catches were also associated with a seasonal latitudinal change in surface temperature, particularly about the isotherms 55° to 65° F. Length frequencies of surface-caught albacore taken in the central and eastern sectors of the North Pacific showed that the same size ranges were sampled on either side of the east-west discontinuity noted above. A latitudinal shift in occurrence similar to that of the albacore was also displayed by other fishes.

SSR-Fish. No. 217 - Summary, Oceanographic and Fishery Data, Marquesas Islands Area, August-September, 1956 (EQUAPAC), by Thomas S. Austin, 191 pp., illus., May 1957. In the late summer (August-October of 1956), two Fish and Wildlife Service research vessels cooperated with those of three other organizations in a quasi-synoptic oceanwide survey of the Pacific Ocean. Operating in the area of the Marquesas Islands, the Hugh M. Smith made detailed physical, chemical, and biological observations in order to define features of oceanic circulation and to obtain information on the abundance and distribution of plant and animal life. Also operating in that area, the Charles H. Gilbert sought to evaluate the tuna resources by long-line and live-bait fishing, by trolling, and by observation of fish schools and bird flocks. Data thus obtained are presented with a description of the field and laboratory procedures involved.

Sep. No. 485 - Maine Herring Explorations and Fishing Gear Experiments.

Sep. No. 486 - Body Fluid Losses of Northern and Southern Oysters.

Sep. No. 487 - Research in Service Laboratories
 (September 1957): Contains two articles--Comparative Study of Fresh-Water and Salt-Water Ice as Preservatives for Haddock; and Standards.

Sep. No. 488 - Lobster and Oyster Culture at Prince Rupert, B. C.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Production of Fishery Products in Selected Areas of Alabama, Florida, Louisiana, Mississippi, and Texas, 1956, by L. A. Keilman, 34 pp., processed, July 1957. (Available free from the U. S. Fish and Wildlife Service, 609-611 Federal Building, 600 South Street, New Orleans, La.) In the first part the author discusses trends and conditions in Gulf Coast fisheries during 1956 and gives a resume of the individual fisheries. For the shrimp fishery a detailed account is given of general conditions, total landings, composition of the landings by species, increase in consumption, canned shrimp, sundried shrimp, "wagerized" shrimp, prices, imports, and data on cold-storage freezings and holdings. Production and market conditions for the oyster, blue crab, and finfish fisheries are discussed, as well as the Gulf tuna fishery and imports of fresh and frozen fish and shellfish. The second part includes shrimp closed seasons in effect in the Gulf States during 1956, minimum shrimp size regulations, conversion factors and container capacities, and shrimp sizes. The second part also contains statistical tables showing total fishery products landings by areas and species, by species and months, by areas and species by months; crab meat production by areas and months; fishery imports through the New Orleans Customs District and Port Isabel and Brownsville, Tex.; and LCL express shipments from New Orleans for 1956 by months and by destination. Also included are tables showing monthly range of wholesale prices of fishery products on the New Orleans French market; Gulf States weekly oyster and shrimp packs, 1955-56 season; Gulf States canned shrimp pack by seasons for a 5-year period; summary of Gulf shrimp landings for selected areas, 1951-56 and 5-year averages; and fishery products market classifications in the Gulf area. The areas covered by the report are: Mobile and Bayou LaBatre, Ala.; Pascagoula and Biloxi, Miss.; New Orleans and Lower Mississippi River, Golden Meadow, Houma, Chauvin, Dulac, Morgan City, Berwick, Patterson, and Delcambre, La.; and Port Arthur, Sabine Pass, Galveston, Freeport, Port Lavaca, Palacios, Aransas Pass, Rockport, Corpus Christi, Port Isabel, and Brownsville, Tex.

Boston Fishery Products Monthly Summary, July 1957, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Landings and ex-vessel prices by species for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; and Boston frozen fishery products prices to primary wholesalers; for the month indicated.

California Fishery Products Monthly Summary, June 1957, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tunalike fish, herring, mackerel, anchovies, and squid; pack of canned tuna, herring, mackerel, anchovies, and squid; market fish receipts at San Pedro, Santa Monica, San Diego, and Eureka areas; California imports; canned fish and frozen fish prices; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, July 1957, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, July 1957, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Fishery production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Ocean City, and Cambridge; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

(Alaska) Progress Report and Recommendations for 1957, 34 pp., illus., processed, November 1956. (Available free from the Administration of Alaska Commercial Fisheries, Fish and Wildlife Service, Juneau, Alaska). This summary provides a brief description of the important Alaskan fisheries, the trends in production, escapement, and fishing effort. Not only is the 1956 season discussed and compared with previous years, but the general recommendations for changes in the 1957 regulations of Alaska fisheries are included.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Climatic Trends and the Distribution of Marine Animals in New England, by Clyde C. Taylor, Henry B. Bigelow, and Herbert W. Graham, Fishery Bulletin 115 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 57), 55 pp., illus., printed, 40 cents, 1957. It is the purpose of this paper to examine temperature fluctuations in recent years, and to explore the relations which may exist between these fluctuations and the abundance and distribution of marine animals along the eastern coast of the United States and in the New England area in particular. In summary, the authors state that "(1) A long-term upward trend in air temperatures in New England is evident from the record. The increase has been greatest for the winter months. (2) Upward trends in winter sea temperatures are shown for St. Andrews, N. B., Boothbay Harbor, Me., and Woods Hole, Mass. The correlation of January water temperatures

at Boothbay Harbor with January water temperatures at New Haven, Conn., and Eastport, Me., indicates a long-term upward trend in surface temperatures corresponding to that for winter air temperatures. (3) Hydrographic data for the Gulf of Maine in 1953 and 1954 indicate an increase of from 1° to 5° F. throughout the water column since the period 1912-26 for most parts of the Gulf. (4) Northward shifts in the abundance and distribution of some important commercial species are indicated by a study of landing statistics and other data. These species include the mackerel, lobster, menhaden, whiting, and yellowtail flounder. (5) Numerous southern species of fishes and other marine forms have extended their recorded ranges northward since 1930. At least two of these, the striped mummichog and the green crab, have established resident populations north of their earlier recorded ranges. But the recent upswing in temperature has not been accompanied by any obvious general alteration in the composition of the fish or invertebrate fauna of the Gulf of Maine region."

New Calanoid Copepods of the Families Aetideidae, Euchaetidae, and Stephidae from the Gulf of Mexico, by Abraham Fleminger, Fishery Bulletin 117 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 57), 11 pp., illus., printed, 15 cents, 1957.

New Genus and Two New Species of Tharybidae (Copepoda calanoida) from the Gulf of Mexico with Remarks on the Status of the Family, by Abraham Fleminger, Fishery Bulletin 116 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 57), 10 pp., illus., printed, 15 cents, 1957.

Role of Coleman Hatchery in Maintaining a King Salmon Run, by Oliver B. Cope and Daniel W. Slater, Research Report 47, 25 pp., illus., printed, 1957, 25 cents. The experiments discussed in this paper concern releases of immature salmon both in the spring and in the fall, so that seasonal comparisons could be made of the numbers of fish which ultimately enter the fishery as adults or return to Coleman Hatchery as adults. According to the authors, "Coleman Hatchery was built on Battle Creek, a tributary of the Sacramento River in northern California, to compensate for losses of spawning areas of the king salmon (*Oncorhynchus tshawytscha*) that resulted from the construction of Shasta Dam. The river was blocked in 1943, and in 1944 studies were inaugurated at Coleman Hatchery to determine (1) how many of the fish entering the valuable sport and commercial salmon fisheries of California had originally been released from the hatchery, and (2) which was the better practice: to release immature salmon from the hatchery in the spring or to release them in the fall. Paired groups of immature salmon from the 1944, 1945, 1947, and 1948 broods were marked by amputating fins in certain combinations, and the fish were released in the Sacramento River--one group in the spring and the other in the fall. Fishery workers inspected the landings in the commer-

cial fishery, principally at Pittsburg, Calif., in the years 1947 through 1952, and others examined salmon taken in the sport fishery on the Sacramento River during some of these years. Records also were kept at the Coleman Hatchery on the marked and unmarked king salmon that returned as adults to the hatchery holding areas during the period 1946 to 1952. The study revealed that king salmon released in the spring from the hatchery were heavier than those released in the fall, but fall-released fish had entered the commercial fishery in greater numbers than had spring-released fish. Most spring-run stock recovered in the spring had been released from the hatchery in the spring, and the greatest proportion of fall-run stock caught in the fall had been released in the fall. Offspring of spring-run salmon tended to return as adults in the spring runs, and offspring of fall run salmon predominated in the fall runs. The average annual percentage of king salmon taken in the commercial gill-net fisheries of California from 1944 to 1948 that was attributable to the Coleman Hatchery was conservatively estimated to be 18.91."

Zooplankton Abundance in the Central Pacific--Part II, by Joseph E. King and Thomas S. Hida, Fishery Bulletin 118 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 57), 34 pp., illus., printed, 30 cents, 1957.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

BYPRODUCTS:

"L'Ossidazione della Vitamina A nell'Olio di Fegato di Tonno e la sua Stabilizzazione per mezzo di Antiossidanti" ("The Oxidation of the Vitamin A in Tuna Liver Oil and its Stabilization by means of Anti-Oxidants"), by A. Buffa, article, Conserve e Derivati Agrumari, vol. 1, no. 4, pp. 10-12, printed in Italian. Centro Sperimentale per l'Industria delle Conserve Alimentari e dei Derivati Agrumari della Regione Siciliana, Palermo, Italy, 1952.

"Studies on Fish Oil--I. Extraction of Liver Oil from the Migrating Fishes," by W. Shimuzu and T. Yamada, article, Bulletin of the Research Institute for Food Science, no. 5, pp. 29-33, printed in Japanese with summary in English. Research Institute, Kyoto University, Kyoto, Japan, 1951. Discusses optimum conditions for the extraction of oil from the livers of migratory fishes which contain less oil than livers of other species.

"Studies on Fish Oil--II. Experiments on Deodorization of Fish Oil, especially on Polymerization by Heat," by W. Shimuzu and Y. Toyohara,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

article, *Bulletin of the Research Institute for Food Science*, no. 6, pp. 19-22, printed in Japanese with summary in English. Research Institute, Kyoto University, Kyoto, Japan, 1951.

"Sul Contenuto in Vitamina A dei Fegati di Tonno dei Mari di Sicilia" (The Vitamin A Content of the Livers of Tuna from Sicilian Waters), by A. Buffa, article, *Conserve e Derivati Agrumari*, vol. 1, no. 1, pp. 16-17, printed in Italian. Centro Sperimentale per l'Industria delle Conserve Alimentari e dei Derivati Agrumari della Regione Siciliana, Palermo, Italy, 1952.

"Sulla Utilizzazione delle Farine di Tonno dopo l'Estrazione del Complesso liposolubile" (The Utilization of Tuna Liver Meal after Extraction of the Liposoluble Complex), by A. Buffa, article, *Conserve e Derivati Agrumari*, vol. 1, no. 2, pp. 13-14, printed in Italian. Centro Sperimentale per l'Industria delle Conserve Alimentari e dei Derivati Agrumari della Regione Siciliana, Palermo, Italy, 1952. A note on the preparation of a dried meal from the material remaining after extraction of the oil from tuna liver. Also given are the composition and possible uses of the meal.

CALIFORNIA:

Forty-Fourth Biennial Report of the Department of Fish and Game for the Years 1954-1956, 96 pp., illus., printed. California Department of Fish and Game, Sacramento 14, Calif., 1957. This report covers a period of intense activity by state agencies and others interested in the development of California's water resources for varied purposes. It describes fully the role of the Department of Fish and Game in these activities. The report of the Director discusses, among other subjects, migratory fish loss, record salmon haul, change in crab laws, new shrimp fishery, pismo clam, Tracy fish screen, warm-water fisheries, increase in hatchery production, and rough fish control work. The section on marine fisheries discusses the work of the Pacific Marine Fisheries Commission; marine sport fisheries—party boat fishing, surf fishing, yellowtail, Salton Sea project; shellfisheries—red abalone, market crab, oysters, ocean shrimp and pismo clams; pelagic fisheries—tuna production, tagging program, albacore, sardines, mackerel fishery, anchovy, and Pacific herring; bottom fisheries—dover sole, rockfish, and sablefish; research vessels; and special activities. Detailed reports are also included on projects concerned with salmon and steelhead, and inland fisheries activities. Fisheries statistics are included in an appendix.

CANADA:

Fisheries Statistics of Canada, 1954, vol. 1, part 3-A, 34 pp. (tables), printed in English and French, 25 Canadian cents. Dominion Bureau of Statistics, Ottawa, Canada, 1957. (For sale by Queen's Printer and Controller of Stationery, Ottawa, Canada.) A review of the fishery statistics of Canada for 1953 and 1954 prepared in collaboration with Dominion and Provincial Fisheries Departments. It includes data on the

quantity and value of the catch of fishery products for Canada as a whole (excluding Newfoundland); production of frozen, smoked, salted, pickled, and canned fish; shellfish production; production of fish oils and fish meal; employment in fish-processing establishments; and value of exports and imports of fishery products. Also contains data on the value of the fisheries by provinces for 1952-1954; Canada's canned lobster pack by provinces for 1945-54; and fishing bounties paid to vessels and boats in 1954.

CANNING:

"Sulla Tecnologia delle Conserve Ittiche. Lavorazione industriale del Tonno" (The Technology of Fish Canning—Industrial Processing of Tuna), by A. Buffa, article, *Conserve e Derivati Agrumari*, vol. 1, no. 2, pp. 172-177, illus., printed in Italian with summary in English. Centro Sperimentale per l'Industria delle Conserve Alimentari e dei Derivati Agrumari della Regione Siciliana, Palermo, Italy, 1953. Describes the following procedures used in the canning of fresh and frozen tuna: cutting up the fish; washing the cut pieces in weak brine; cooking in brine; drying by centrifuging, and filling into the cans; addition of hot oil; and sterilization. Diagrams showing some of the equipment used are included.

CHEMICAL COMPOSITION:

"Relationship between Jelly Strength and Chemical Composition of Fish Meat Jelly," by M. Okada and A. Yamazaki, article, *Bulletin of Tokai Regional Fisheries Laboratory*, no. 13, pp. 83-90, printed in Japanese with summary in English. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan, 1956.

EELS:

Eels--A Biological Study, by Leon Bertin, 200 pp., illus., printed. Cleaver-Hume Press Ltd., London, England, 1956.

FLORIDA:

Early Diagenesis and Lithification of Shallow-Water Carbonate Sediments in South Florida, by Robert N. Ginsburg, Contribution No. 156, 21 pp., illus., printed. Reprinted from *Regional Aspects of Carbonate Deposition*, a publication of the Society of Economic Paleontologists and Mineralogists. The Marine Laboratory, University of Miami, Coral Gables, Fla.

The Fishes of Alligator Harbor, Florida, with Notes on Their Natural History, by Edwin B. Joseph and Ralph W. Yerger, Contribution No. 71, 46 pp., illus., printed. Oceanographic Institute, Florida State University, Tallahassee, Fla.

Quarterly Report on Fisheries Research, June 1957, No. 57-19, 13 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla. A report to the Florida State Board of Conservation on fisheries research covering shrimp, spotted weakfish, tarpon, snook, gamefish, sailfish, black spot and spoilage control, and rancidity in fish.

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FOOD ADDITIVES:

General Principles Governing the Use of Food Additives (Report of the Joint FAO/WHO Expert Committee on Food Additives, First Session, Rome, Italy, 3-10 December 1956), (FAO Nutrition Meetings Report Series No. 15,) 29 pp., printed, 1s. 6d. (30 U. S. cents). Food and Agriculture Organization of the United Nations, Rome, Italy, 1957. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) The increase in the number of chemicals used or proposed for use in or on foods has imposed upon public health authorities and other governmental agencies the responsibility for deciding whether or not such substances should be employed. This paper discusses the circumstances governing the use of food additives and other factors to be taken into account in food additives control.

FOOD AND AGRICULTURE ORGANIZATION:

Canada: Small Fishing Inspection Regulations, Pursuant to the Canada Shipping Act, Food and Agricultural Legislation, vol. V, no. 4, XVI/4/56.1, 36 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1956. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.)

New Zealand: The Fisheries (General) Regulations 1950 to 1955 Under the Fisheries Act, 1908, Food and Agricultural Legislation, vol. V, no. 4, XVI/5/56.1, 23 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1956. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.)

GEAR:

The Selection and Care of Nylon Gill Nets for Salmon, by P. J. G. Carrothers, Industrial Memorandum No. 19, Fisheries Research Board of Canada, Technological Station, Vancouver, B. C., Canada. This informative and useful manual goes into great detail on the subject of nylon. The first section discusses the many different forms of this synthetic fiber and points out how their different properties adapt nylon to different jobs. Other sections deal with the strength and weight of nylon nets, the way in which nets should be ordered in view of the fact that all brands are not marked the same, the kinds of dyes to use and their application, the manner in which nets may become weaker, the various kinds of lines, floats and leads, and other materials for gill-net web, such as terylene, silk, glass fiber, orlon, rayon, and saran.

GENERAL:

Atlas de Peche de la Mer du Nord (Fishery Atlas of the North Sea), by Jean Furnestin, 12 maps, printed. Institute Scientifique et Technique des Peches Maritimes, 59 Avenue Raymond Poincaré, Paris XVIE, France, 1956.

Defense Guides for Commercial Food Facilities, Agriculture Information Bulletin No. 169, 15 pp., printed, 10 cents. Food and Materials Re-

quirements Division, U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This bulletin, used as a guidebook, discusses factors for reducing the vulnerability of food facilities to attack or other enemy action. It was developed to provide "guidance and leadership in the development of plans and programs to insure continuity of operation of vital foodfacilities in event of attack." While the factors contained in this guidebook have applicability to many industrial concerns, it was developed primarily for use in the field of food processing and wholesale distribution.

A Naturalist in Palestine, by Victor Howells, 180 pp., illus., printed, \$6. Philosophical Library Inc., 15 East 40th St., New York 16, N. Y., 1957. A well-illustrated book describing the flora and fauna of Palestine--the area that is now Israel and Jordan. Of special interest is a chapter on Lake Tiberias (Israel) in which the author includes descriptions of the fish and shellfish that he found there.

The Physical Bases for an Index of Biological Productivity, by F. C. W. Olson, Contribution No. 66, 4 pp., printed. Oceanographic Institute, Florida State University, Tallahassee, Fla.

Small Business and the Federal Trade Commission, by David R. Reel, Small Marketers Aids No. 24, 4 pp., printed. Small Business Administration, Washington 25, D. C., June 1957.

HYDROGRAPHY:

Hydrography of a Positive, Shallow, Tidal Bar-Built Estuary (Report on the Hydrography of the Polluted Area of Biscayne Bay), by Ilmo Hela, Clarence A. Carpenter, Jr., and J. Kneeland McNulty, Contribution No. 175, 53 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 7, no. 1, pp. 47-99, March 1957.) The Marine Laboratory, University of Miami, Coral Gables, Fla.

JAPAN:

Technical Report of Fishing Boat, No. 10, 111 pp., illus., printed in Japanese with brief English abstracts. Fishing Boat Laboratory, Production Division, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyodaku, Tokyo, Japan, April 1957. Contains, among others, the following reports, with very brief abstracts in English: "Analysis of Two-Boat Trawling Net by Automatic Net Height Meter by Measuring Simultaneously Two Points of the Net," by Chikamasa Hamuro; "Study on Pressure-Spring Thermometer," by Kenji Ishii; "Noise of Yellowtail when it comes into the Set Net--Relation between the Noise and Amount of Catch--Relation between the Intensity of Noise and Weather," by Tomiju Hashimoto, Minoru Nishimura, and Yoshinobu Maniya; "Experiment on Difference between the 24 kc. Fish-Finder and the 200 kc. Fish-Finder," by Tomiju Hashimoto, Yoshinobu Maniya, and Minoru Nishimura; and "Study on Simplified Record Type SONAR and Its Field Test," by Tomiju Hashimoto, Yoshinobu Maniya, and Minoru Nishimura.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

MAINE:

Commercial Fisheries of Maine, by George H. Taylor, 43 pp., illus., printed. Department of Sea and Shore Fisheries, Augusta, Me., January 1957. A brief but comprehensive survey of Maine's oldest industry--its commercial fisheries. Some indication of the importance of this industry over the years and of its potential value for the future is included. This exceptionally well-written and beautifully-illustrated booklet gives in some detail the history of Maine's commercial fisheries and describes individually and briefly the developments in its various fish and shellfish industries.

MEXICO:

Los Peces del Valle de Mexico (The Fishes of the Valley of Mexico), by J. Alvarez del Villar and Leopoldo Navarro G., 62 pp., illus., printed in Mexican, 1957. Secretaría de Marina, Dirección General de Pesca e Industrias Conexas, Mexico City, Mexico.

MUSSELS:

Environmental Factors Governing the Infection of Mussels, *MYTILUS EDULIS*, by *MYTILICOLA INTESTINALIS*, by B. T. Hepper, Ministry of Agriculture, Fisheries and Food Fishery Investigations, Series II, vol. XX, no. 3, 24 pp., illus., printed. Her Majesty's Stationery Office, London, England, 1955.

NETHERLANDS:

Diagnose-Rapport Visserij, 1956 (Voorlopige Berekening van de Bedrijfsresultaten van de Visserij over 1956) (Survey of Costs and Profitability of the Dutch Fishing Industry), Rapport No. 270, 53 pp., illus., processed, in Dutch. Landbouw-Economisch Instituut, The Hague, Holland. A brief survey of costs and profitability of the Dutch fishing industry in the years 1951-56. The report begins with a general view of the landings and value. Before 1954 the landings increased slowly, and since 1954 the landings have decreased, due mainly to a decrease in the catch of herring. Total value, however, shows a gradual increase. The value (US\$30.8 million in 1956) of the Dutch exports of fish during the last few years exceeded the value of the landings. Herring (fresh, cured, smoked or canned in tins) is the main export product. Sole, oysters, mussels, and shrimp also depend on foreign demand. The earnings of the individual branches of the Dutch fisheries were variable. The value of middle-water fisheries, herring fisheries, and the fisheries on the Lake IJssel was unfavorable, due to lower catches and increased costs. The near-water and inshore fisheries (shrimp) were satisfactory.

Economic Research into Fisheries, by A. G. U. Hildebrandt, 14 pp., processed. Agricultural Economics Research Institute, Fisheries Department, Van Stolkweg 29, The Hague, Holland, June 1956. Discusses the reasons for economic research in the fisheries, the organization of economic research in the fisheries of the Netherlands, the method adopted, and the results achieved.

NIGERIA:

White Paper on Federal Fisheries Service, Sessional Paper No. 6 of 1957, 4 pp., printed. Federal Government Printer, Lagos, Federation of Nigeria. The Federal Government of Nigeria has considered the problem of fisheries research in the light of the many recommendations made, and this paper contains the details of the Government's proposals, which are based largely on a program drawn up by the Fisheries Technical Committee of the Council of Natural Resources. The aim of fisheries research, sea fisheries research, study and development of inland fisheries, and the marketing and processing of fish are discussed. This paper also contains a glossary of scientific and vernacular names of the various fishes mentioned.

OYSTERS:

Crabs as Predators of Oysters in Louisiana, by R. Winston Menzel and Sewell H. Hopkins, 8 pp., illus., processed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 46, pp. 177-184.) Oceanographic Institute, Florida State University, Tallahassee, Fla.

"Effect of Ionizing Radiations on Southern Oysters," by Elizabeth Ann Gardner and Betty M. Watts, article, Food Technology, vol. 11, no. 6, June 1957, pp. 329-331, printed, single copy--domestic, \$1.50; foreign, \$1.75. The Garrard Press, 510 North Hickory, Champaign, Ill. Describes a study involved in the determination of whether or not oysters can be irradiated at dosages high enough for partial or complete sterilization without producing undesirable side reactions. Also determined was the extent to which irradiation of the oysters inhibited souring and pH changes in uncooked oysters. These are believed to be due to enzymatic action. It was concluded that "Radiation of raw oysters with gamma rays up to doses of 3.5×10^6 rep produced an off-odor described as 'grassy.' Neither free sulfhydryl group nor catalase activity was noticeably reduced. Subsequent souring and fall in pH occurred both in irradiated oysters and in unirradiated controls, indicating that this type of spoilage is probably caused by enzymes within the oyster rather than by bacteria. The radiation of cooked oysters produced a somewhat different type of off-odor described as 'oxidized.' The development of off-odors was not prevented by the addition before radiation of various antioxidants and free radical acceptors. The most acceptable irradiated products after brief storage periods were those radiated raw but subsequently heated sufficiently to destroy enzymes. The heating eliminated the grassy odor as well as prevented subsequent enzymatic souring. Radiation of live oysters in the shell was not found to be an effective means of opening the shells for removal of oysters. Fairly high doses were required to kill the oysters and the shells did not open immediately after killing doses."

The Effect of Temperature on the Ciliary Action and Other Activities of Oysters, by R. Winston Menzel,

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Contribution No. 67, 12 pp., illus., printed. Oceanographic Institute, Florida State University, Tallahassee, Fla.

The 1951 Oyster Stock in the Rivers Crouch and Roach, Essex, Fishery Investigations Series II, vol. XXI, no. 2, 34 pp., illus., printed, \$1.53. (For sale by British Information Services, 45 Rockefeller Plaza, New York 20, N. Y.) Ministry of Agriculture, Fisheries and Food, London, England. The results of a preliminary stock survey of oyster population in the Rivers Crouch and Roach (England) in 1951, following the work which had been started in 1947 to help the industry regain its former prosperity, forms the first part of this paper. A description of experimental work designed to clarify the picture of oyster distribution arising from the survey and an account of efficiency tests on various types of dredges are also included.

Some Additional Differences between CRASSOSTREA VIRGINICA and OSTREA EQUESTRIS in the Gulf of Mexico Area, by R. Winston Menzel, Contribution No. 30, 6 pp., processed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 46, pp. 76-81.) Oceanographic Institute, Florida State University, Tallahassee, Fla.

PRESERVATION:

"Industries de Traitement des Produits de la Peche. Salage, Fumage, Sechage, et Semi-Conсерves" (Industries Treating Fishery Products. Salting, Smoking, Drying, and Semi-Preserves), by D. Remy, article, Industries Agricoles et Alimentaires, no. 73, pp. 799-806, printed in French. Association des Chemistes et Ingénieurs de la Sucrerie Distillerie et Industries Agricoles de France et de l'Union Francaise, Paris (10^e), France, 1956. An account of materials and processes used in France for salting, drying, and smoking fish, and for preparing semi-preserves of herring, anchovies, sprats, and fish roes, and marinades.

"On the Preparation of Reversibly Dried Fish Meat," by M. Takei and T. Takahashi, article, Bulletin of Tokai Regional Fisheries Research Laboratory, no. 14, pp. 91-97, printed in Japanese with summary in English. Tokai Regional Fisheries Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan, 1956

"Studies on Processing Squid Meat," by T. Takahashi and M. Takei, article, Bulletin of Tokai Regional Fisheries Research Laboratory, no. 14, pp. 31-50, printed in Japanese with summary in English. Tokai Regional Fisheries Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan, 1956.

REFRIGERATED WAREHOUSES:

Materials Handling in Public Refrigerated Warehouses, by Theodore H. Allegri and Joseph F. Herrick, Jr., Marketing Research Report No. 145, 125 pp., illus., processed, 60 cents. (For sale by Superintendent of Documents, Government Printing Office, Washington 25, D. C.) Marketing Research Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C. This report, one of a series

on handling food, was developed primarily to guide operators of public refrigerated warehouses in reducing the labor and costs required for various physical handling and warehouse operations. It outlined some of the methods for obtaining increased productivity while minimizing worker fatigue. Although it deals with refrigerated warehouses, the results of the study are applicable to other types of warehousing. The report is intended as a manual or guide for plant managers and other supervisory workers. Therefore, the methods, types of equipment used, and conditions influencing their use are described in considerable detail.

ROCKFISH:

A Review of the Rockfishes of California (Family SCORPAENIDAE), by Julius B. Phillips, Fish Bulletin No. 104, 158 pp., illus., printed. Department of Fish and Game, Marine Fisheries Branch, 926 Jay St., Sacramento 14, Calif., 1957. This publication is designed to assist fishermen and processors in the proper identification of the rockfishes and scorpionfishes found in the ocean waters of California. Photographs of each of 52 species and 3 hybrids are presented with the common and scientific name; range; greatest depth in which taken and maximum size; distinguishing characteristics; detailed measurements; and other common names.

SAILFISH:

Studies on the Age and Growth of the Atlantic Sailfish, *Istiophorus americanus* (Cuvier), Using Length-Frequency Curves, by Donald P. DeSylva, Contribution No. 165, 20 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 7, no. 1, pp. 1-20, March 1957.) The Marine Laboratory, University of Miami, Coral Gables, Fla.

SALMON:

Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia, 1956, 12 pp., processed. Department of Fisheries, Pacific Area, 1110 Georgia St., West., Vancouver, B.C., 1957. Presents British Columbia's commercial and sports catch of salmon by species for 1953-56, summary of sport fishing catches by area, commercial catch of troll caught salmon, and the estimated monthly sports catch of salmon for each area.

SELLFISH:

Manual of Recommended Practice for Sanitary Control of the Shellfish Industry (Part II: Sanitation of the Harvesting and Processing of Shellfish), 1957 Edition, PHB Publication No. 33, 29 pp., printed, 35 cents. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.) This guide outlines the basic sanitary standards for the cooperative state-industry-Public Health Service program for the certification of interstate shellfish shippers. The guide includes recommended sanitation practices for harvesting boats and establishments which process oysters, clams, or mussels. The manual is intended as a guide

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for (1) the preparation of state laws and regulations controlling the harvesting and processing of shellfish for shipment in interstate commerce, (2) the shellfish industry in the maintenance of sanitary conditions during the harvesting and processing of shellfish, and (3) persons who are responsible for evaluation and supervising sanitary conditions in the harvesting, shucking, processing, packing, and shipping of shellfish. The manual is also used by the Public Health Service in evaluating state shellfish-sanitation programs to determine whether or not the programs are acceptable for endorsement.

SHRIMP:

"Effect of Storage on Decomposed Canned Shrimp," by H. C. Barry, J. F. Weeks, Jr., and R. E. Duggan, article, *Journal of the Association of Official Agricultural Chemists*, no. 39, pp. 801-805, printed. Association of Official Agricultural Chemists, Box 540, Benjamin Franklin Station, Washington 25, D. C., 1956.

Notes on Rock Shrimp, SICYONIA BREVIROSTRIS (Stimpson), from Exploratory Trawling off the South Carolina Coast, by G. Robert Lunz, Contributions from Bears Bluff Laboratories No. 25, 10 pp., illus., printed. Bears Bluff Laboratories, Wadmalaw Island, S.C., August 1957.

SPAIN:

Introducción a una Estadística de Pesca Fluvial 1954, (Introduction to Statistics on River Fisheries), by R. de Rada, 153 pp., illus., printed in Spanish. Ministerio de Agricultura, Dirección General de Coordinación, Crédito, y Capacitación Agraria, Madrid, Spain. A report, mainly composed of charts and tables, which describes the organization of Spain's National Fluvial Fishery Service and presents its fundamental problems. Discusses, among others, the following: restocking the rivers; fishing licenses and regulatory measures; the salmon resources; comparison between 1953 and 1954 of salmon caught in rivers; the decline of the sturgeon fishery; total weight of fluvial catch in 1954; principal species of fish in Spanish rivers and where each may be found; the seasons for catching fish and crabs in various regions; and the minimum size regulations concerning the principal species.

SPOILAGE:

"Effect of Freezing on Coliform Bacteria and Method of Detection in Frozen Fish Fillets and Blocks," by H. P. Dussault, article, *Progress Reports of the Atlantic Coast Stations*, no. 65, pp. 12-14, printed. Fisheries Research Board of Canada, Ottawa, Canada, 1956.

"The Freshness of Fish and the Amount of Histamine Presented in the Meat, I--1. The Production of Histamine in Fish Meats during the Autolysis; 2. The Production of Histamine in Fish Meats during the Progress of Spoilage which was caused by the Action of Bacteria. (1) On the Effect of Temperature; and 3. The Production of Histamine in Fish Meats during the Progress of Spoilage which was caused by

the Action of Bacteria. (2) On the Effect of H-Ion Concentration," by M. Kimata and A. Kawai, article, *Memoirs of the Research Institute for Food Science*, no. 5, pp. 25-54, printed. Research Institute, Kyoto University, Kyoto, Japan, 1953.

"The Freshness of Fish and the Amount of Histamine Presented in the Meat, II--1. On the Production of Histamine during the Autolysis in the Meats of Shark and Octopus; and 2. The Influence of Temperature on the Production of Histamine during Autolysis in Red Meat Fish," by M. Kimata and A. Kawai, article, *Memoirs of the Research Institute for Food Science*, no. 6, pp. 12-22, printed. Research Institute, Kyoto University, Kyoto, Japan, 1953.

"The Freshness of Fish and the Amount of Histamine Presented in the Meat, III," by M. Kimata, A. Kawai, and M. Tanaka, article, *Memoirs of the Research Institute for Food Science*, no. 7 pp. 6-11, printed. Research Institute, Kyoto University, Kyoto, Japan, 1954.

"The Freshness of Fish and the Amount of Histamine Presented in the Meat, IV," by M. Kimata, A. Kawai, and M. Tanaka, article, *Memoirs of the Research Institute for Food Science*, no. 8, pp. 1-6, printed. Research Institute, Kyoto University, Kyoto, Japan, 1954.

"A New Species of Bacterium which Produces Large Amounts of Histamine on Fish Meats, Found in Spoiled Fresh Fish," by M. Kimata and M. Kawai, article, *Memoirs of the Research Institute for Food Science*, no. 6, pp. 1-2, printed. Research Institute, Kyoto University, Kyoto, Japan, 1953. A description of a new species of bacterium, *Achromobacter histamineum*, isolated from spoiled fish.

"On the Bacteria Causing Spoilage of Fresh Fish, especially on their Activity which can Produce Histamine," by M. Kimata and M. Tanaka, article, *Memoirs of the Research Institute for Food Science*, no. 7, pp. 12-17, printed. Research Institute, Kyoto University, Kyoto, Japan, 1954.

"On the Urea-Splitting Bacteria Causing the Spoilage of Fresh Fish," by M. Kimata and Y. Hata, article, *Memoirs of the Research Institute for Food Science*, no. 5, pp. 54-64, printed in English. Research Institute, Kyoto University, Kyoto, Japan, 1953.

"The Production of Histamine by the Action of Bacteria Causing the Spoilage of Fresh Fish, I," by M. Kimata and A. Kawai, article, *Bulletin of the Research Institute for Food Science*, no. 12, pp. 29-33, printed in Japanese with summary in English. Research Institute, Kyoto University, Kyoto, Japan, 1953.

"Quantitative Variations in the Bacterial Flora of Flatfish," by J. Liston, article, *Journal of General Microbiology*, vol. 15, pp. 305-314, printed. Society for General Microbiology, Cambridge University Press, 200 Euston Road, London, N. W. 1, England, 1956.

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"A Study whether the Bacteria Having an Activity which can Produce a Large Amount of Histamine Former, are Present or not, on the Surface of Fresh Fish," by M. Kimata and M. Tanaka, article, Memoirs of the Research Institute for Food Science, no. 8, pp. 7-16, printed. Research Institute, Kyoto University, Kyoto, Japan, 1954.

SPORT FISH:

The Charles F. Johnson Oceanic Gamefish Investigations, Summary of Investigation for the Period Comprising September 1956 through April 1957, by Gilbert L. Voss and C. Richard Robins, Progress Report No. 3, 12 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla.

TUNA:

"Volatile Acids, Succinic Acid, and Histamine, as Indices of Decomposition in Tuna," by F. Hillig, article, Journal of the Association of Official Agricultural Chemists, no. 39, pp. 773-800 printed. Association of Official Agricultural Chemists, Box 540, Benjamin Franklin Station, Washington 4, D. C.

WHALING:

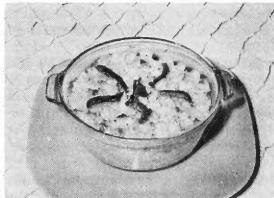
Gremio dos Armadores da Pesca da Baleia, Relatório e Contas do Exercício de 1956 e Orçamento para 1957 (Whaling Vessel Owners' Guild, Statement of Operations for 1956 and Budget for 1957), 37 pp., illus., printed in Portuguese. A Comissão Revisora de Contas, Lisbon, Portugal.



CRAB CASSEROLE

Crab meat is the cooked meat from hard-shell crabs that is packed in cans and marketed either fresh, frozen, or canned. Crab meat is marketed from

four principal kinds of crabs. They are the blue crabs from the Atlantic and Gulf coasts, the Dungeness crabs on the Pacific Coast from Alaska to Mexico, the king crabs from the North Pacific off Alaska, and the rock crabs taken on the New England and California coasts.



Crab meat is tender and possesses a distinctively sweet flavor. It is an excellent source of high-quality proteins, vitamins, and minerals needed for good nutrition. The meat from any type of crab can be used interchangeably in all recipes.

The home economists of the United States Fish and Wildlife Service suggest that you serve "Quick Crab Casserole," a main dish which can be prepared by using fresh, frozen, or canned crab meat.

QUICK CRAB CASSEROLE

1 POUND CRAB MEAT	DASH PEPPER
½ CUP COOKED PEAS	½ CUP GRATED CHEESE
1 CAN (10½ OUNCES) CONDENSED MUSHROOM SOUP	PAPRIKA

Remove any shell or cartilage from crab meat. Combine peas, soup, pepper, and crab meat. Place in 6 well-greased individual 5-ounce custard cups. Sprinkle cheese and paprika over top of crab mixture. Bake in a moderate oven, 350° F., for 20 to 25 minutes or until brown. Serves 6.

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JAPANESE USE WATER SPRAY TO ATTRACT TUNA FOR POLE-AND-LINE FISHING

The Japanese use a water-spray system to attract tuna to the vessel when they are fishing a school of tuna with pole and line.

This spray system as developed by the Japanese consists of a power-driven pump which supplies a constant flow of sea water to a number of spray outlets, situated at 3 to 4-foot intervals along the walk from which the fishing is done. In Japan, a 125-gross-ton vessel will have one or two centrifugal pumps with 4- to 5-inch intakes. These deliver water into one or two header pipes, depending on whether fishing is done from one or both sides of the vessel. A distributing pipe is laid along the fishing walk. The water pressure is low, and a gentle spray falls between 6 and 18 feet from the hull of the vessel, forming a ruffled band which will be from 4 to 8 feet wide. It is assumed that the ruffling of the surface water hides the vessel and the fishermen from the fish. Also, the tuna demonstrate a "feeding frenzy" which may be heightened by the spray system.

Although the actual value of the method is difficult to determine, its commercial use where pole-and-line fishing for tuna takes place (Japan, Hawaii, Eastern Pacific Ocean, and Cuba) shows clearly that fishermen are thoroughly convinced that it is useful. This method is used only for fishing tuna with pole and line.

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NATIONAL TUNA WEEK

In order to encourage the greater use of canned tuna in oil, the supply of which is plentiful, the U. S. Department of Interior's Bureau of Commercial Fisheries, the Department of Agriculture, and the entire tuna industry worked together to bring "National Tuna Week" to the attention of the public.

SPECIAL

**FISHERIES
MARKETING
BULLETIN**

U.S. DEPARTMENT OF THE INTERIOR • BUREAU OF COMMERCIAL FISHERIES

OCT. 31-NOV. 9, 1957

TUNA

**SUPPLIES ARE
PLENTIFUL & ECONOMICAL**

THE UNITED STATES DEPARTMENT OF THE INTERIOR, THE DEPARTMENT OF AGRICULTURE, AND THE ENTIRE TUNA INDUSTRY ARE WORKING TOGETHER TO ENCOURAGE THE GREATER USE OF CANNED TUNA IN OIL WHICH IS THE PLENTIFUL FOODS COVERAGE DURING OCTOBER.



ment of Agriculture in its plentiful foods coverage for October.

In this promotion, as in the past, the Bureau of Commercial Fisheries prepared promotional fliers for school-lunch managers and supervisors, institutional feeding plants, food editors, and others who expressed an interest in cooperating in this promotional program. Some of the Bureau's field staff was available for this program on a full-time basis two weeks prior to the beginning of "National Tuna Week." The Bureau's home economists were scheduled to present fish-cookery demonstrations on television during that week.

Canned tuna in oil was also included by the Depart-